GURU NANAK DEV ENGINEERING COLLEGE, BIDAR, KARNATAKA

VALUE ADDED COURSES

SYLLABUS

Session 2019-2020

PRINCIPAL
Guru Nanak Dev Engg. College, Bidar

Civil Engineering Department

Law For Engineer

Total Duration: 35 Hrs.

Course Objectives:
The aim of the course is provide general exposure to the students about the elementary knowledge of law that would be of utility in their profession; to enable the students to appreciate the importance of law and its impact on business and society.

Course Outcome:
1. Identify and explore the basic features and modalities about Indian constitution.
2. Differentiate and relate the functioning of Indian parliamentary system at the center and statelevel.
3. Differentiate different aspects of Indian Legal System and its related bodies.
4. Discover and apply different laws and regulations related to engineering practices.
5. Correlate role of engineers with different organizations and governance models

Detailed Syllabus:

Unit I - Introduction to Law and Law Making
Law: its meaning, sources and concepts; Constitutional Law with emphasis on Fundamental Rights, Directive Principles of State Policy and Fundamental Duties; Law making in India.

Unit II – General Principles of Contract under Indian Contract Act, 1872
Sec. 1 to 75 of Indian Contract Act and including Government as contracting party, Kinds of government contracts and dispute settlement, Standard form contracts; Promissory Estoppel and Legitimate Expectations

Unit III – Adjudicatory System in India
Adjudicatory System in India as under the Constitution and statutes; Tribunals and Commissions like Competition Tribunal and Consumer Protection Commissions; Alternative Dispute Resolution: Nature, Scope and Types; Arbitration and Conciliation Act, 1996; Legal Services Authority Act, 1986.

Unit IV – Law Relating to Intellectual Property
Concept of Property, Types of Property; Introduction to IPR; Types of IPR: Copyrights, Patents, Trademarks, Designs, Trade Secrets, Plant Varieties and Geographical Indications; Infringement of IPRs and Remedies available under the Indian Law.

Unit V – Privacy in Governance and Transparency
Confidentiality in Government Business/Administration: Official Secrets Act, 1923; Right to Information Act, 2005 covering, Evolution and concept; Practice and procedures; Privileged Communications under the Indian Evidence Act, 1872; Offences under the Information Technology Act, 2000 with special reference to Protected Systems; Labour Disputes and the Settlement – Industrial Disputes Act, 1947; Collective bargaining; Industrial Employment (Standing Orders) Act, 1946; Payment of Wages Act, 1936.

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Reference:

1. D.D. Basu (1996), Shorter Constitution of India, Prentice Hall of India
1. M.P. Jain (2005), Indian Constitutional Law, Wadhwa & Co.
2. M.P. Singh (1998), Constitutional Law of India, Eastern Book Co.
3. P.M. Bakshi (2003), Constitution of India, Universal Law Publishing Co.
4. H.M. Seervai (1993), Constitutional Law of India, Tripathi Publications

5. Agarwal H.O.(2008), International Law and Human Rights, Central Law Publications
6. S.K. Awasthi & R.P. Kataria(2006), Law relating to Protection of Human Rights, Orient Publishing
7. S.K. Kapur(2001), Human Rights under International Law and Indian Law, Central Law Agency Meena Rao (2006), Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset
8. Neelima Chandiramani (2000),The Law of Contract: An Outline, 2nd Edn. Avinash Publications
9. Mum Avtarsingh(2002), Law of Contract, Eastern Book Co.
10. Dutt(1994), Indian Contract Act, Eastern Law House
11. Anson W.R.(1979), Law of Contract, Oxford University Press
12. Kwatra G.K.(2005), The Arbitration & Conciliation of Law in India with case law on UNCITRAL Model Law   on Arbitration, Indian Council of Arbitration Effective
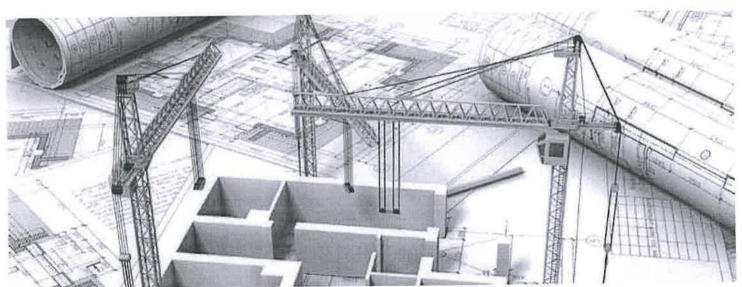
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VALUE ADDED COURSES

SYLLABUS

Session 2019-2020

Civil Engineering Department

STADD PRO

Total Duration: 36 Hrs.

Course Objectives:

1. To train the students in structural Modeling, Designing and Analysis.
2. This course will help the students to familiarize on the analysis and design of different kinds of structures
3. STAAD.Pro is one of the popular software that is used for analysing & designing structures like – buildings, towers, bridges, industrial, transportation and utility structures

Course Outcome:

1. Student will be able to complete object-oriented instinctive 2D/3D graphic model generation.
2. learn to rectify modeling, load application, and run time errors.
3. To create constants, supports, and sSpecifications.
4. Learn how to interpret the analysed results from Staad Pro & create economic Designs.
5. Students will know to perform code check, member selection, and optimized member selection consisting of analysis/design

About STADDPRO: STAAD.Pro® is one of the most widely-used software for developing and analyzing the designs of various structures, such as petrochemical plants, tunnels, bridges etc. STAAD.Pro® v8i, the latest version, allows civil engineering individuals to analyze structural designs in terms of factors like force, load, displacements etc. It supports all types of various steel, concrete, and timber design codes. Using STAAD Pro, civil engineers can design any type of structure, and later share the synchronized model data amongst the entire design team

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Detailed Syllabus:

UNIT I
Modelling

Introduction to STAAD - Starting a project - Modeling a structure Creating Nodes & Members Geometry wizard - Property definition - Material definition - Support definition - Specifications

UNIT II
Loading

Nodal load - Member loads - Uniform Force and Moment - Concentrated Force and Moment - Linear Varying Load - Trapezoidal Load - Hydrostatic Load - Area load - Floor load

UNIT III
Load definitions

Wind load - Creating Load Combination - Automatic Load Combination - Edit Auto Load Rules - Moving load - Seismic load

UNIT IV
Analysis and Design

Frame Analysis – Truss Analysis – Concrete Design – Steel Design

UNIT V
Project report

Importing CAD Models - Report Setup – Plotting from STAAD.Pro – Final Project

References Book
1. Staad Pro V8i for Beginners by T.S.Sarma
2. Design of R.C.C. Buildings Using Staad Pro V8i by T.S.Sarma
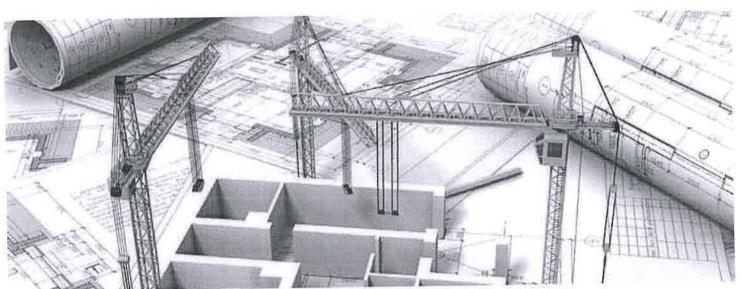3. STAAD. Pro 2005 Tutorial (with U.S. Design Codes) by Munir M. Ahmad

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VALUE ADDED COURSES

SYLLABUS

Session 2019-2020

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Civil Engineering Department

Surveying Using Total Station

Total Duration: 35 Hrs.

Course Description

This course covers the different features of total station, from basic operations till a layout preparation and setting out operations. The students will be introduced to the concept of Electronic distance measurements (EDM) and processing of the data.

Learning objective

The objective of this course is to enable the students to prepare layout of buildings, roads and carry setting out operations.

Detailed Syllabus:

Unit I - INTRODUCTION TO TOTAL STATION

About Total station - components– functions – difference from conventional instruments – Electronic display and data reading - Tripod setting – Bubble setting and Tilt setting – Focussing - optical prism handling.

Unit II – PRELIMINARY OPERATIONS

Creating New Job/File, Station setting, orientation – angle, coordinates - Back Sight, Fore Sight – change point - measuring and storing points

Unit III – APPLICATIONS

Data collect – Missing line measurements - Resection – Set out – Area & Volume – Remote elevation – Road Stake out.

Unit IV – DATA MANAGEMENT

Data manager – Data transfer – Exporting and Importing data – Working with GEOMAX office - File Conversions 4

Unit V – PROJECT REPORT

Preparation of Layout sketches – Buildings and sample road projects.

References Book
1. Advanced Surveying: Total Station, GIS and Remote Sensing by Satish Gopi
2. Surveying & Levelling, 2/E—Subramanian—Oxford University Press
3. Surveying and Levelling Vol. II by T. P. Kanetkar and S. V. Kulkarni Pune Vidyarthi Publication.
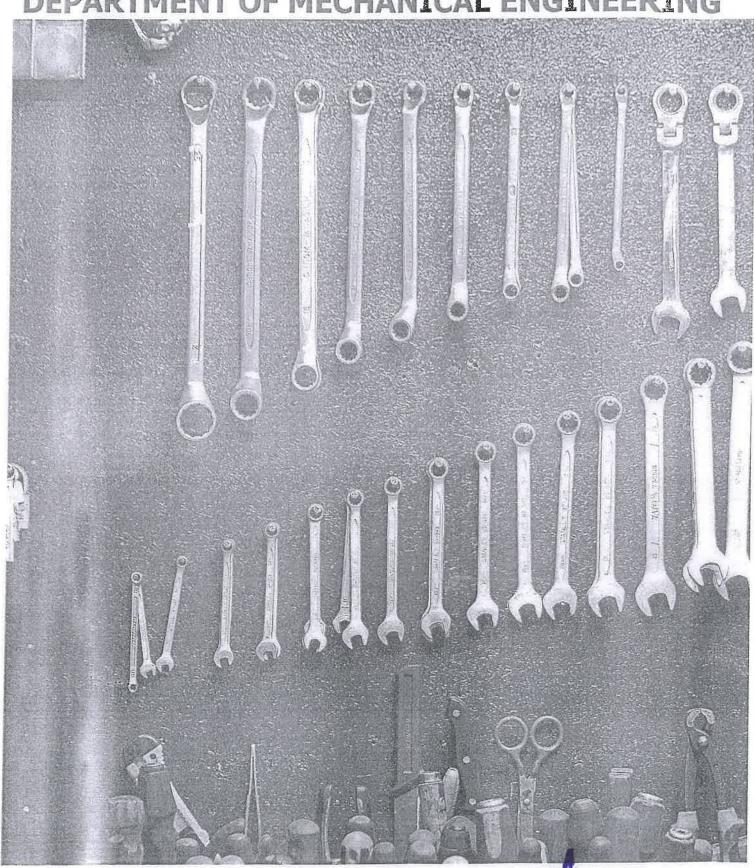
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ADD ON COURSES

SYLLABUS

Session 2019-2020

PRINCIPAL
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DEPARTMENT OF MECHANICAL ENGINEERING

3-D Printing

Total Duration: 30 Hrs.

Course Objectives:

3D Printing is a method of creation that requires computer skills. This course will allow students to discover the potential of 3D printing. This course is an excellent option for anyone who ever wanted to prototype an invention, create a work of art, customize a product

Course Outcomes:

Upon completion of this course, students will be able to:

* Demonstrate knowledge of key historical factors that have shaped manufacturing over the centuries Explain current and emerging 3D printing applications in a variety of industries
* Describe the advantages and limitations of each 3D printing technology
* Evaluate real-life scenarios and recommend the appropriate use of 3D printing technology
* Identify opportunities to apply 3D printing technology for time and cost savings
* Discuss the economic implications of 3D printing including its impact on startup businesses and supply chains
* Design and print objects containing moving parts without assembly

About 3D Printing

Industries and institutions are fast adopting 3D Printing. They employ engineers and designers with 3D printing training as prototype and product engineers. 3D Printing experts are employed in design houses that provide 3D design, 3D computer-aided design (CAD) modeling, biological and scientific modeling.

Detailed Syllabus:

MODULE- I

Introduction to 3D Printing.Types of 3D Printing ,Working Principal of 3D Printer

MODULE-II

Principle Processes-Extrusion, Wire granular Lamination, Photo polymerization, Materials-Paper, plastics,Metals,Ceramic s, Glass , Wood, Fiber, Sand, Biological

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tissues   Hydrogels,   Graphene,   Material   selection-
Processes,applications,limitations

MODULE-III

Inkjet Technology Printer-Working principles , Positioning systems, Print head, print bed, Frames, Motion control; print head considerations- Continuous Inkjet , Thermal Inkjet, Piezoelectric Drop on Demand

MODULE-IV

Material formulation for jetting: Liquid based fabrication Continuous Multijet Powder based fabricxation-color jet

MODULE-V

Industrial Applications; Product Models, manufacturing —Printed electronics, Biopolymers, Packaging,Healthcare , Food , Medical,Biotechnoly,Display : Open Source: Future Trends

References Book
1. Functonal Design for 3D Printing: Designing Printed Things for Every Usebook — Clifford Smyth
2. 3D concrete PrintingTechnology: Construction and Building Applications —Jay G Sanjayan Publisher Butterworth Heinemannh
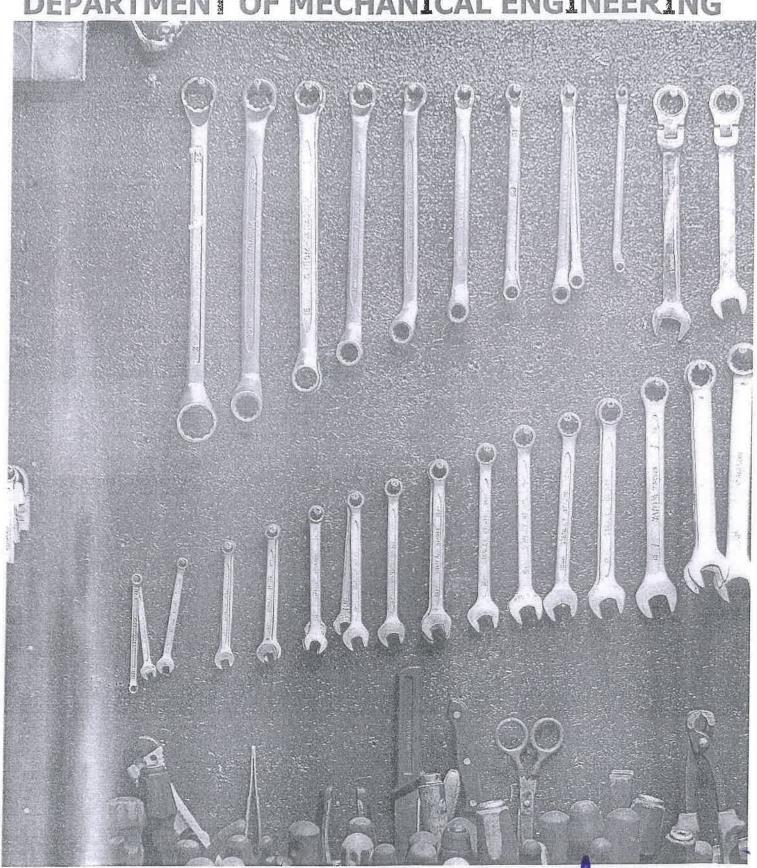3. 3D Printing Technology, Applications and Selection —Rafiq Noorani

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ADD ON COURSES

SYLLABUS

Session 2019-2020

DEPARTMENT OF MECHANICAL ENGINEERING

Desktop Publication (DTP)

<div align="right">Total Duration: 30 Hrs.</div>

Course Objectives:
This course provides an opportunity to produce a series of publications suitable for portfolio inclusion. Students will use industry-standard page-layout and graphics software. They will gain a thorough grounding in print production technology and procedures, including how to communicate with other print professionals, estimate costs, and deal with digital output

Course Outcome:
• Acquire and apply the skills to write works of fiction and non-fiction, edit professionally, create digital content, design print and web-based products, develop and manage writing and editing projects
• apply and creatively adapt theoretical and technical knowledge and skills to reflect the needs and expectations of varied readerships and markets

MODULE I:
Introduction to DTP, Introduction to Printing, Types of Printing, Offset Printing, Working of offset Printing, Transparent Printout, Negative & Positives for Plate ware making, Use of DeskTop Publishing in Publications, Importance of D. T. Pin Publication, Advantage of D. T. Pin Publication, Mixing of graphics & Image in a single page production, Laser printers - Use, Types, Advantage of laser printer in publication

MODULE II:
Introduction to adobe PageMaker/In-Design, PageMaker tool box, PageMaker palettes Menus, Icons and dialog box, the control palette, page layout, creating and saving documents, typography, Modifying character attributes, importing graphics, Editing and cropping images, Using the picture palette, The color palette.

MODULE III:
Introduction to Coral Draw graphics, Features of Corel Draw, Corel Draw Interface, Tool Box, Effects, Drawing and Coloring, Creating Basic Shapes, Working with Bitmaps, Applying effects on Bitmaps, Introduction to Text Tool, Artistic and paragraph text, Wrapping Text around Object.

MODULE IV:
Introduction to Basics of Quark express, navigating a QuarkXPress Document, Setting Up the Document, multi-page documents, formatting text, Manipulating Graphics

MODULE V :
Introduction to Photoshop, Understanding Tools & Workspace, Image/Photo Editing-Mixing- Enhancements, Converting Color to b/w and b/w to Color, Shortcuts to work efficiently, Creating Web Graphics.

TEXT & REFERENCE BOOKS:
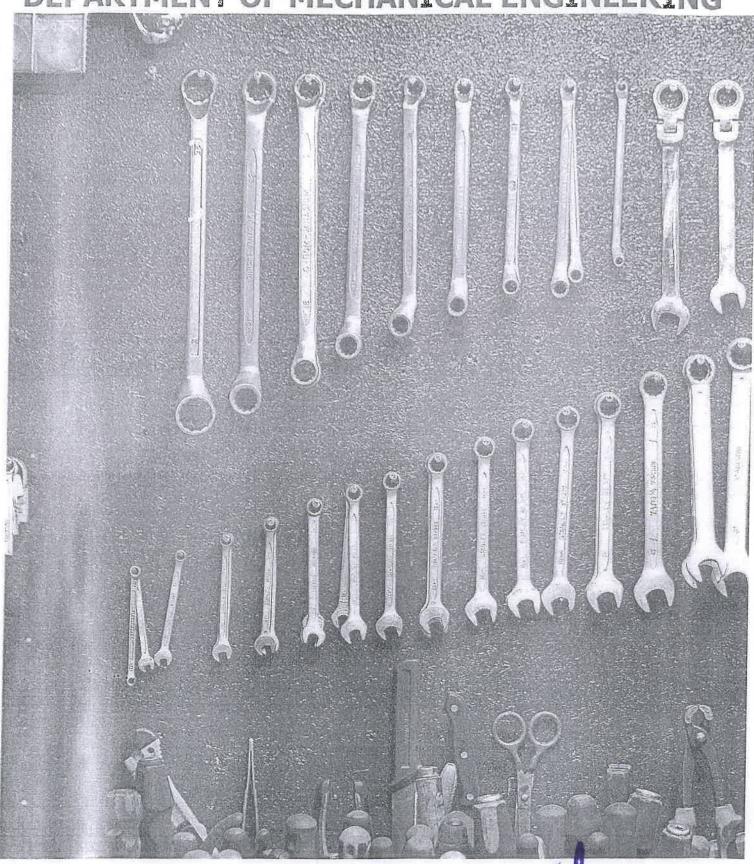1. Adobe PAGE MAKER .
2. Prakhar complete course for DTP

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ADD ON COURSES

SYLLABUS

Session 2019-2020

DEPARTMENT OF MECHANICAL ENGINEERING

ROBOTIC PROGRAMMING

Total Duration: 30hrs

COURSE OBJECTIVES:

To impart knowledge on

- Fundamentals of robot working, programming and integration in a manufacturing process
- Working of robot mechanical, power, measuring and control system, robot kinematics, dynamic,control and programming, Kinematics, path planning and control.
- Visualization on the view of the robotics impact in human future

COURSE OUTCOMES :

Upon completion of the course students will be able to
- Identify the importance of robotics in today and future goods production
- Explore knowledge on basics of robotics programming like VAL, AML
- Perform robot configuration and subsystems
- Analyze the principles of robot programming and handle with typical robot

MODULE I

Fundamentals of robot programming
- Robot – Definition
- Robot Anatomy
- Co-ordinate Systems,
- Pitch, Yaw, Roll, Joint Notations, Speed of Motion, Pay Load
- Robot Parts and Functions
- Need for Robots
- Different Applications

MODULE II
- Introduction to Robo DK
- 3D Mouse Navigation
- Keyboard Shortcuts
- Menu icons
- Robot controls and Simulation

MODULE III
- Robotics
- Computer Vision
- Microworld Simulation
- Introduction to dLife
- ControlCenter
- dLife Examples

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MODULE IV
- Vision
- Introduction to Python and Pyro
- Control Paradigms

MODULE V

- Manipulation
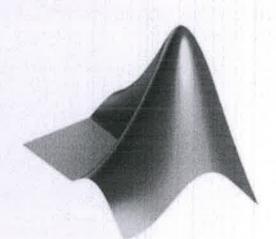- Learning
- Mapping
- Multi-robot communication

WEB REFERENCES:
1. http://www.robotc.net/
2. http://www.toptal.com/robotics/programming-a-robot-an-introductory-tutorial
3. http://www.robotmaster.com/en/why-robotmaster

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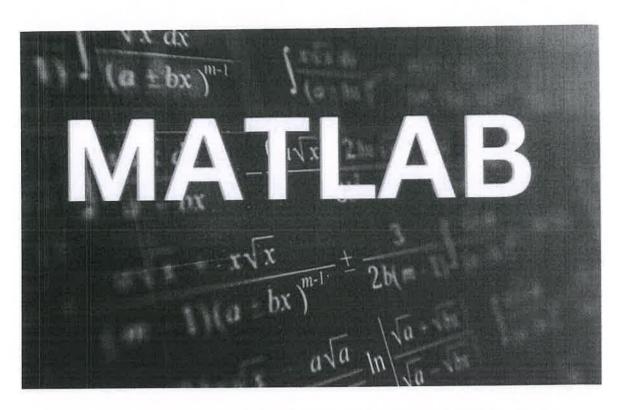
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ADD-ON COURSES

SESSION 2019-20

SYLLABUS

MATLAB

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MATLAB

ELECTRICAL AND ELECTRONICS ENGINEERING

Matlab Features

Mat lab for Engineers

Total Duration: 30 hrs

Course Objectives:

- MATLAB introduces students to basic MATLAB programming concepts.
- MATLAB is a software package for carrying out numerical computations and analyses.
- It uses blocks of data called matrices (MATLAB stands for matrix laboratory).
- MATLAB is probably the most commonly used scientific and engineering numerical software

About Mat lab:

MATLAB or (Matrix Laboratory) is a high performance fourth generation programming language which is used for technical computing. It provides multi paradigm numerical computing environment and was developed by Math Works. It is used for integrating computation, visualization, and programming so that the programming environment becomes easy to use. The applications of MATLAB are immense. It is a powerful linear algebra tool with a very good collection of toolboxes; therefore it finds applications in research and teaching on domains of robotics and automation.

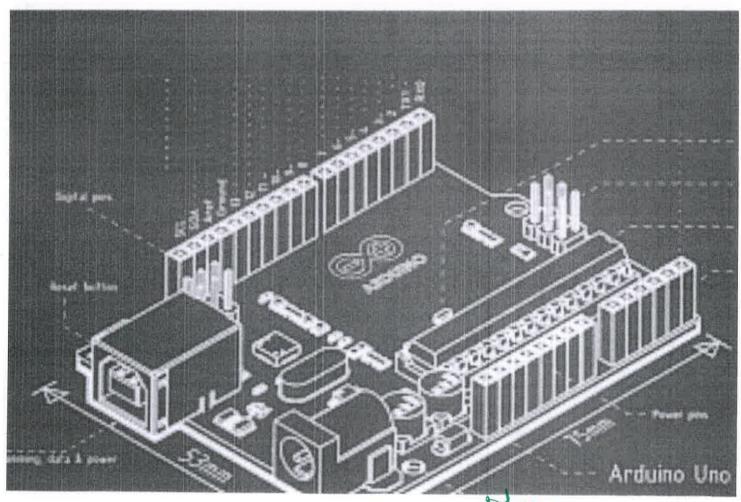| Course Outcomes:		Knowledge Level, KL
Upon the completion of the course, the student will be able to:		
CO1	Understand fundamental operations in Mat lab.	K3
CO2	Perform statistical data analysis, data interpolation by Mat lab.	K4
CO3	Solve differentiation equation with Mat lab.	K4
CO4	Acquire a reasonable level of competence in designing optimization algorithms; solve linear programming, constrained and unconstrained optimization problems by Mat lab.	K4
CO5	Apply Mat lab to solve practical engineering problems.	K3
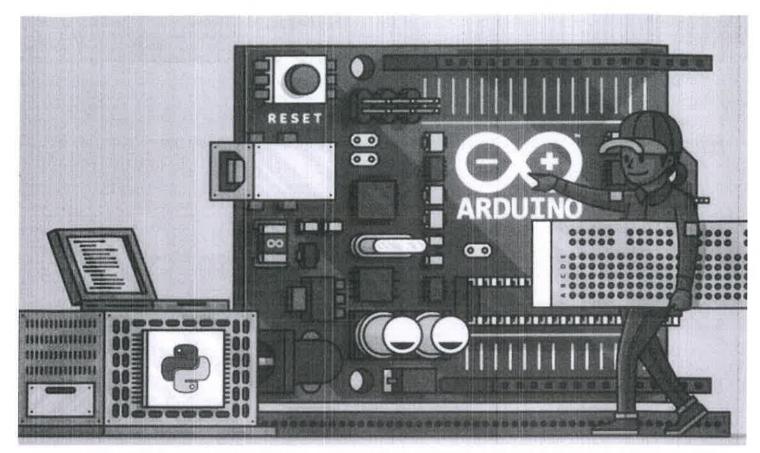
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ADD-ON
COURSES

SESSION 2019-2020

SYLLABUS

ELECTRICAL AND ELECTRONICS ENGINEERING

Arduino Uno

ARDUINO Programming

Total Duration : 30 hrs

Course Objectives:

To impart knowledge on

- Relation between python and ARDUINO programming for developing applications.
- The working of python ARDUINO prototyping and networking.

About ARDUINO:

Arduino is an open-source platform that is a combination of hardware and software. Arduino is easily accessible - even for those who don't know much about electronics. Arduino boards are simple a type of microcontroller. They are able to read inputs from the sensors and turn those inputs into output.

Course Outcomes:		Knowledge Level, KL
Upon the completion of the course, the student will be able to:		
CO1	Understand the basics of Ardunio.	K3
CO2	Develop simple programs using ARDUINO IDE.	K4
CO3	Create programs and interfacing ARDUINO with FIRMATA protocol.	K4
CO4	Design GUI for different applications.	K4
CO5	Develop web application using python.	K4

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Detailed syllabus:

UNIT I GETTING STARTED WITH PYTHON AND ARDUINO

Introduction to Python-Installing Python and Setup tools -The fundamentals of Python programming-Introduction to Arduino-Getting Started with the Arduino IDE-Introduction to Arduino programming

UNIT II WORKING WITH FIRMATA PROTOCOL AND THE PYSERIAL LIBRARY

Connecting the Arduino board- Introducing the Firmata protocol- Getting started with pySerial-Bridging pySerial and Firmata- Motion-triggered LEDs- Using a standalone Arduino sketch- Using Python and Firmata

UNIT III PYTHON-ARDUINO PROTOTYPING

Prototyping- Working with pyFirmata methods- Prototyping templates using Firmata-Prototyping with the I2C protocol

UNIT IV WORKING WITH THE PYTHON GUI

Learning Tinker for GUI design- Your first Python GUI program- Widgets- Storing and plotting Arduino data - Working with files in Python- Getting started with matplotlib-Plotting real-time Arduino data

UNIT V INTRODUCTION TO ARDUINO NETWORKING

Arduino and the computer networking- Developing web applications using Python- RESTful web applications with Arduino and Python- MQTT – A lightweight messaging protocol
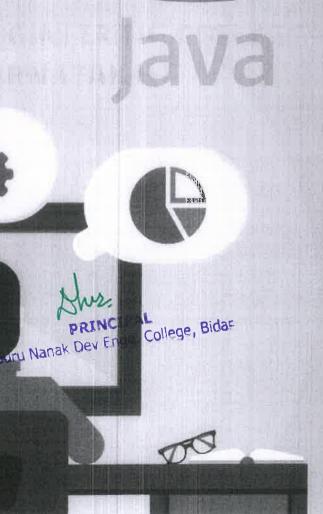
WEB REFERENCES:

- http://www-01.ibm.com/software/data/infosphere/hadoop/what-is-big-data-analytics.html
- https://education.emc.com/guest/campaign/data_science.aspx
- https://www.thoughtworks.com/big-data-analytics 4. http://birtanalytics.actuate.com/what-is-big-
- data-analytics

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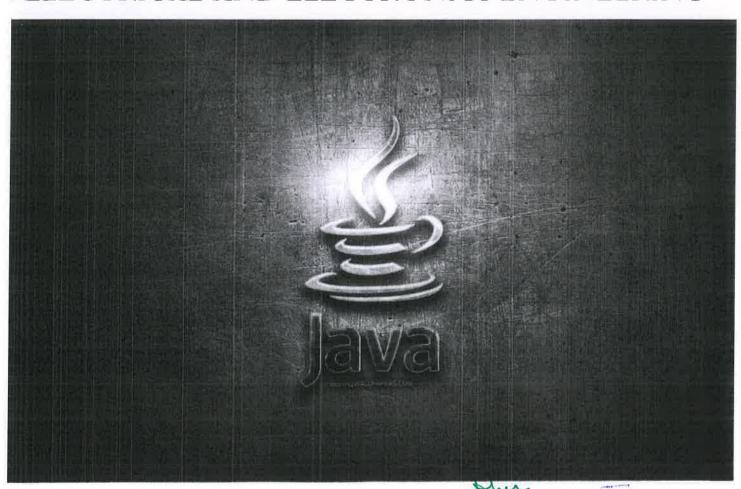Guru Nanak Dev Engg. College, Bidar

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ADD-ON COURSES

SESSION 2019-2020

SYLLABUS

Java

ELECTRICAL AND ELECTRONICS ENGINEERING

JAVA Programming

Total Duration: 30 hrs

Course Objectives:

To impart knowledge on

- The principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy the requirements given
- Competence to design, write, compile, test and execute straightforward programs using a high level language;
- Have an awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- To be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.

About JAVA:

Java is a general-purpose, class-based, object-oriented programming language designed for having lesser implementation dependencies. Java is a programming language and a platform. Java is a high level, robust, object-oriented and secure programming language.Java was developed by Sun Microsystems. Java is fast, secure, and reliable. Therefore. It is widely used for developing Java applications in laptops, data centers, game consoles, scientific supercomputers, cell phones, etc.

Course Outcomes:		Knowledge Level, KL
Upon the completion of the course, the student will be able to:		
CO1	Understand various types of selection constructs in a Java program.	K3
CO2	Use built-in classes found in the Java API	K4
CO3	Create Java programs that leverage the object-oriented features of the Java language.	K4
CO4	Apply error-handling techniques using exception handling.	K4
CO5	Provide solution to a given set of requirements using threads, multithreading and synchronization.	K3

Detailed syllabus:

MODULE 1: Java Fundamentals

Introduction to Java – Features of java – JVM – API document – Naming conventions and Data types - Data types in java – Operators

MODULE 2: Declarations, Initializations and Scoping

Accepting Input from the keyboard – Reading Input with Scanner class- Arrays – Single Dimensional Array – Two dimensional Array – Jagged arrays – Strings- String Buffer and String Builder class- Access specifier

MODULE 3: Flow Control

If else statement- do while loop – for loop – Nested for loops – for each loops – switch statement – break statement- continue statement – return statement

MODULE 4: Object Oriented Concepts

Classes and objects – Methods in java – Relationship between objects – Inheritance – Polymorphism- Type casting – Abstract Classes – Interfaces – Packages

MODULE 5: API Contents

Java 3D- Java Advanced Imaging – Java Mail – Java Message Service – Java Media Framework –Java Naming and Directory Interface – Java OpenGL

MODULE 6: Exceptions, Generics and Collections

Errors in java Program – Exception handling mechanism – throw clause- Types of Exceptions -Generic classes – Collection objects – Sets – Lists – Queues – Maps – Stack class- HashSet class –ArrayList class – Vector class – StringTokenzier class – Calendar class- Date class

MODULE 7: Threads

Single tasking – Multi tasking – Uses of threads – Thread class methods – Deadlock of threads –thread Communication – Thread priorities – Thread group – Daemon threads – Application ofthreads.

WEB REFERENCES:

- http://www3.ntu.edu.sg/home/ehchua/programming/java/j2_basics.html
- http://beginnersbook.com/java-tutorial-for-beginners-with-examples/
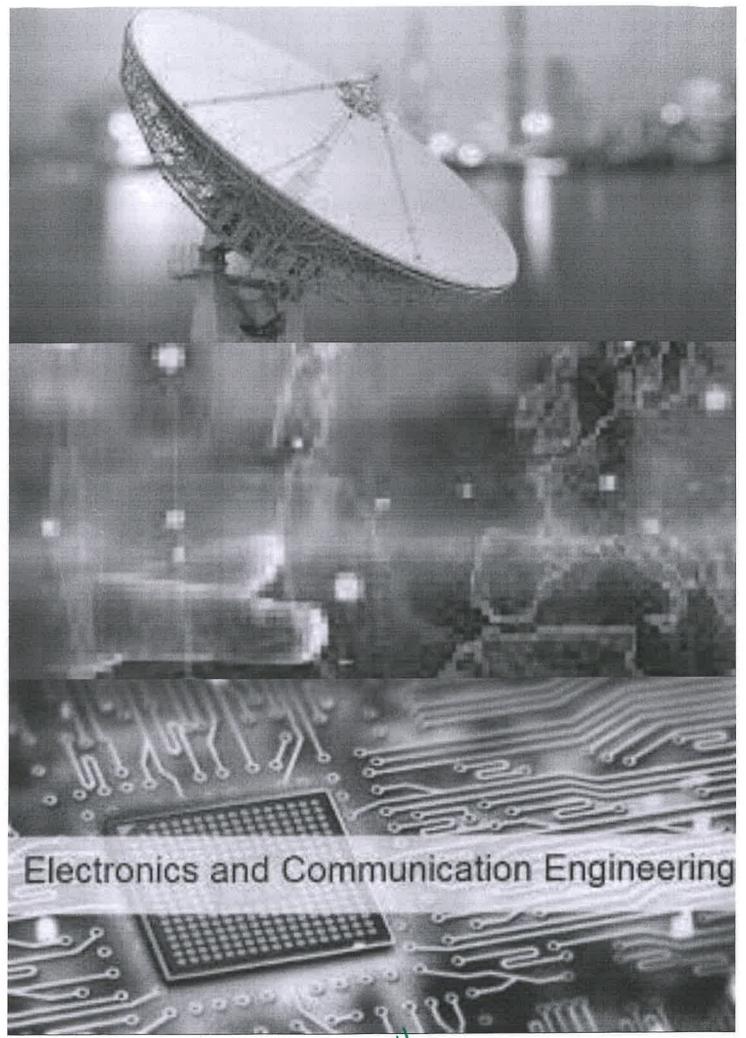
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ADD-ON COURSES

SYLLABUS

Session 2019-2020

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Electronics and Communication Engineering

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NETWORK SIMULATOR- NS3

Total Duration: 31 Hrs.

Pre-requisites of course: C Programming, Sound Knowledge of OOP Programming and Basic knowledge of Computer Networks. Basic computer literacy is expected.

Course Objectives:

To impact Knowledge on

- Basic concepts in Computer Networks.
- NS3 Simulator to simulate Network topologies and protocols.
- Python scripting and apply it to develop network topologies and protocols.
- Modify and Optimize the internal modules in NS3.

About NS-3: *NS-3* has been developed to provide an open, extensible network simulation platform, for networking research and education. In brief, *ns-3* provides models of how packet data networks work and perform, and provides a simulation engine for users to conduct simulation experiments. Some of the reasons to use *ns-3* include performing studies that are more difficult or not possible to perform with real systems, to study system behavior in a highly controlled, reproducible environment, and to learn about how networks work. Users will note that the available model set in *ns-3* focuses on modeling how Internet protocols and networks work, but *ns-3* is not limited to Internet systems; several users are using *ns-3* to model non-Internet-based systems.

Course Outcomes:	
CO1	Explore the basic knowledge in networking concepts.
CO2	Simulate various network topologies and protocols using NS3.
CO3	Develop network topologies and protocols using Python Scripting in NS3.
CO4	Develop/Modify the internal modules in NS3 to enhance various performance metrics.

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Detailed Syllabus:
UNIT-I

OVERVIEW OF COMPUTER NETWORKS
Introduction to Networks, Networking Components: Bridge, Switch, Router, Layered Approach: Physical Layer, Data Link Layer, Network Layer, Transport Layer and Application Layer, PerformanceMetrics.

UNIT II

OVERVIEW OF NS3

Introduction to NS3, Architecture, Installation of NS3 in Linux (Ubuntu), Simulation Objects in NS3: Node, NetDevice, Channel, Packet, Sockets, Applications, EventScheduling, Callbacks, Internet Node and its members; Introduction to NS3 Program, Existing Classes and Objects in NS3.

UNIT III

SIMULATIONS USING NS3

Point-to-Point Communication, Bus Network Topology, Wireless Network Topology, WiMAX, AODV Routing, TCP Congestion Control, Trace output using ASCII and PCAP tracing, Plot Graph.

UNIT IV

PYTHON SCRIPTING AND INTERNALS IN NS3

Python: Introduction to Python Scripting, Client Server Application Using Python, Working with Internals and Protocol modification in NS3: Ethernet, WiMAX, TCP, UDP, ICMP, AODV.

UNIT V

PROJECT IMPLEMENTATION IN NS3

Project Demo, Modifying/Developing a module of existing network to enhance the Performance: Energy Efficient Wireless Sensor Network / Adhoc Network, Routing protocol optimization for Mobilenetwork.

REFERENCE BOOKS:

1. Behrouz A. Foruzan, "Data communication and Networking", Tata McGraw-Hill, Fifth Edition, 2013.
2. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Morgan Kauffmann Publishers Inc., Third Edition, 2003.
3. Jack L. Burbank, "An Introduction to Network Simulator 3", Wiley-Blackwell, First Edition, 2016

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VALUE ADDED COURSES

SYLLABUS

Session 2019-2020

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Electronics and Communication Engineering

INTERNET OF THINGS USING ARDUINO

Total Duration: 30hrs

Course Objectives:

The Internet is evolving to connect people to physical things and also physical things to other physical things all in real time. It's becoming the Internet of Things (IOT). The course enables student to understand the basics of Internet of things and protocols. It introduces some of the application areas where Internet of Things can be applied. Students will learn about the middleware for Internet of Things. To understand the concepts of Web of Things.

Learning Outcomes:
After doing this course, students should be able to design and deploy multiple IOT devices that could connect to the gateway.

Course Contents:

Module 1
IOT - What is the IOT and why is it important? Elements of an IOT ecosystem, Technology drivers, Business drivers, Trends and implications, Overview of Governance, Privacy and Security Issues.

Module 2
IOT PROTOCOLS - Protocol Standardization for IOT — Efforts — M2M and WSN Protocols --- SCADA and RFI
Protocols — ISsues with IOT Standardization — Unified Data Standards — Protocols — IEEE802.15.4—BACNet Protocol— Modbus — KNX — Zigbee- Network layer — APS layer — Security

Module 3
IOT ARCHITECTURE - IOT Open source architecture (OIC)- OIC Architecture & Design principles- IOT Devices and deployment models- loTivity : An Open source IOT stack - Cverview- loTivity stack architectureResource model and Abstraction

Module 4
IOT ARCHITECTURE - IOT Open source architecture (OIC)- OIC Architecture & Design principles- IOT Devices and deployment models- loTivity : An Open source IOT stack - Overview- loTivity stack architectureResource model and Abstraction

Module 5
The Arduino Environment: Introduction to the Arduino environment, the Arduino board, the Arduino IDE, and the Arduino compatible shields together with their libraries. Arduino board main components, inputs, and outputs. Arduino Integrated Development Environment (IDE), Compiling Code, Arduino Shields Libraries.

Module 6
Basics of C programming, composition of an Arduino programs, Arcuino tool chain, Arduino IDE, basic structure of a sketch, including the use of the setup() and loop() functions. Accessing the pins from a sketch for input and output, introduction on debugging embedded software on an Arduino, UART communication protocol, Synchronization, parity and stop, the use of the Serial library to communicate with the Arduino through the serial monitor.

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Text Books:

I . Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.

2. Massimo Banzi, "Getting Started with Arduino", First Edition, February 2009, O'Reilly Media, Inc

Reference Books:

1. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-onApproac '0, VPT, 2014

2. Alex Bradbury and Ben Everard, "Learning Python with Raspberry Pi", Feb 2   John Wiley Sons

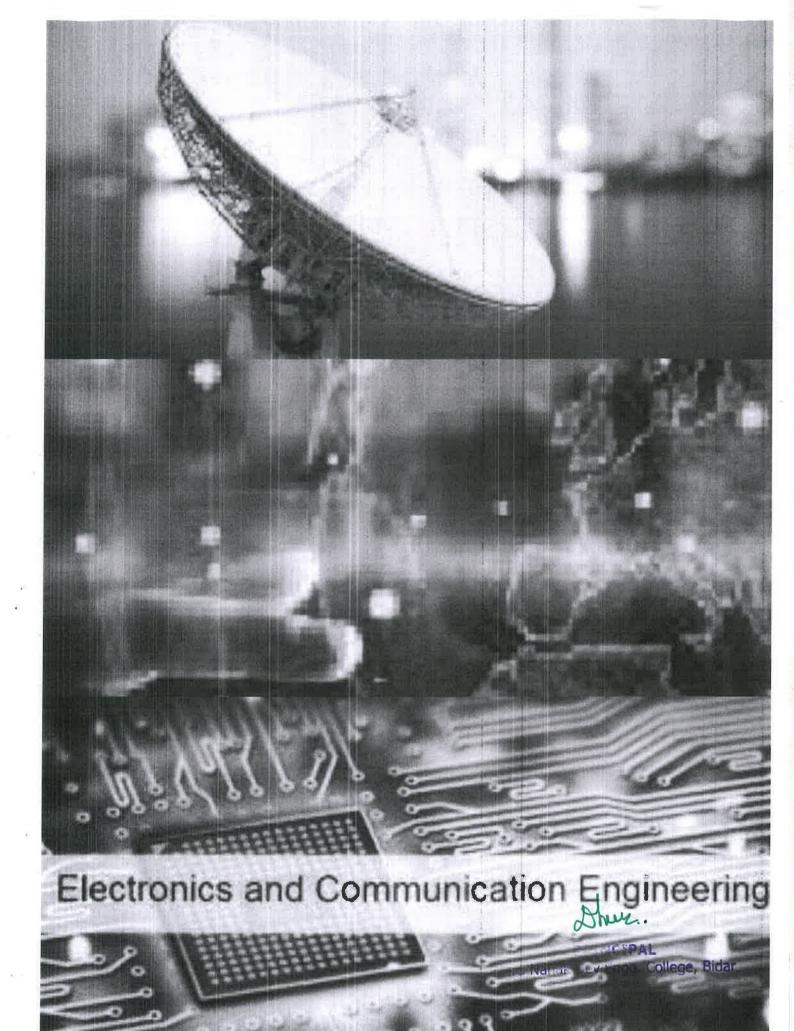3. Michael Margolis, "Arduino Cookbook", First Edition, March 201 1 , O'Reilly Me

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ADD-ON COURSES

SYLLABUS

Session 2019-2020

Electronics and Communication Engineering

Deep Learning with Python

Total Duration: 30 Hrs.

Pre-requisites of course: C Programming, Basic computer literacy is expected.

Course Objectives:

Deep Learning with Python, covers concepts that will help you dive into the future of data science and implement intelligent systems using deep learning with Python. Through this course, you'll learn convolutional, recurrent neural networks and build up the theory that focuses on supervised learning and integrate into your product offerings such as search, image recognition, and object processing. Finally, you'll start working with deep learning right away. This course will make YOU confident about its implementation in your current work as well as further research.

Course Outcomes:		Knowledge Level, KL
Upon the completion of the course, the student will be able to:		
CO1	Enhance programming skills in core Python.	K3
CO2	Demonstrate the concepts of important Python concepts such as Data handling, Functions, File Operations, Modules, Packages, Object-Oriented, API concepts, and many Python libraries such aso Pandas, Numpy, Matplotlib and many more	K3
CO3	Understand and apply Deep Learning techniques to a variety of problems.	K3

KL-Bloom's Knowledge Level (K1, K2, K3, K4, K5.K6)
K_1-Remember K_2 - Understand K_3-Apply K_4.- Analyze K_5.- Evaluate K_6 Create

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Detailed Syllabus:

UNIT-I

Python Basics, Python Data Structures, Python Programming Fundamentals, Working with Data in Python, Working with NumPy Arrays.

UNIT-II

Data Analytics Overview, Python Environment Setup and Essentials, Mathematical Computing with Python (NumPy), Scientific Computing with Python (SciPy), Data Manipulation with Pandas, Machine Learning with Scikit—Learn, Data Visualization in Python using Matplotlib.

UNIT -III

Deep Neural Network and Tools, Multiple Outputs, Multiclass classification, Activation Functions, Feed forward, Convolutional Neural Net (CNN), Recurrent Neural Networks, Autoencoders.

UNIT-IV

Backpropagation intuition, Chain Rule, Derivative Calculation, Fully Connected Backpropagation, Matrix Notation, Numpy Arrays, Learning Rate, Gradient Descent, EWMA, Optimizers, Inner Layers Visualization, Reinforcement Learning.

UNIT V

Introduction to Tensorflow, Tensorflow :Eager execution and hello world, Tensorflow: Modelling an equation in Tensorflow, Calculating loss and gradient, Regression using tensorflow (Eager Execution and Eager Normalization), Gradient, Keras framework, Classification using MNIST.

Assessment:

1. Every student has to give periodic 'tests consisting of Programming tasks and Objective Questions.

2. At the end of the Course each student will give a presentation on a topic covered in the course.

Companies Using Python

Companies like Infosys, tcs, tata elxsi, Kpit etc use python

References Book

1. Deep Learning with Python, By Francois Chollet, Manning Publications; 1st edition.
2. Deep Learning using Python, By S Lovelyn Rose, L Ashok Kumar and D KarthikaRenuka, Wiley

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ADD-ON COURSES

SYLLABUS

Session 2019-2020

COMPUTER SCIENCE & ENGINEERING

OBJECT ORINTED PROGRAMMING WITH C++

Sub Code: GNCSCPP319   **Total Duration: 30Hrs.**

Pre-requisites of course: C Programming, Basics of Engineering Mathematics, Basic computer literacy is expected.

Course Objectives:
- To understand why C++ is a useful OOP language for developers.
- To learn how to design and program C++ to implement oops concepts
- To learn how to use control statements, arrays, IO streams and exceptions in C++ programs.
- Develop C++ programs using Object-Oriented concepts.

About C++:
C++ language is a superset of the 'C' language and was initially known as "C with Classes". In "C" operator ++ is used to increment the value by 1. That means to the language 'C', developers have added some extra features and hence named as C++. C++ is a general-purpose programming language and supports object-oriented programming features.

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	Course Outcomes:	Knowledge Level, KL
	Upon the completion of the course, the student will be able to:	
CO1	Able to develop programs with reusability.	K2
CO2	Develop programs for file handling.	K3
CO3	Handle exceptions in programming.	K3
CO4	Develop applications for a range of problems using object-oriented programming techniques.	K4

KL-Bloom's Knowledge Level (K1, K2, K3, K4, K5.K6)
K_1-Remember K_2- Understand K_3-Apply K_4.- Analyze K_5.- Evaluate K_6.- Create

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	C++ Basics	5
2	Flow Control	5
3	Static & Dynamic Polymorphism	5
4	Inheritance	5
5	IO streams & files	5
6	Exceptions	5

Total hours: 30

Detailed Syllabus:

Module 1:- Introduction C++ and Language Features, First C++ Program, How C++ differs from C, Variables Declaration, Function overloading, Optional Parameters, Reference Variables, Operator overloading, Basics of Console Input and Output, Constant Pointers Dynamic Memory Allocation   6 hours

Module 2:- OOPs Concepts, Overview of OOPs Principles, Introduction to classes & objects Creation & destruction of objects, Data Members, Member Functions, this Pointer, Constructor &Destructor, Static class member, Friend class and functions, Namespace
                                                                                      6 hours

Module 3:-- Inheritance, Introduction and benefits, Access Specifier, Base and Derived class Constructors, Types of Inheritance, Down casting and up casting, Function overriding, Virtual functions., Destructor overriding   6 hours

Module 4:- Polymorphism, What is Polymorphism, Pure virtual functions, Virtual Base Class
                                                                                      6 hours

Module 5:- I/O Streams & Exception Handling, C++ Class Hierarchy, File Stream, Text File Handling, Overloading << and >> operators, Introduction to Exception, Try and catch block. Throw statement, Writing custom Exception class.   6 hours

Companies Using C++

Companies ranging from automotive, banking, and software implement the MATLAB software. The lists of companies in automotive sector using the C++ Software are:

Industrial Light and Magic
Google
Facebook
Instagram
Spotify
Quora
Netflix
Dropbox
Reddit

References:
1. Object Oriented Programming in C++ by Robert Lafore Techmedia Publication.
2. The complete reference C – by Herbert shieldt Tata McGraw Hill Publication.
3. Object Oriented Programming in C++ Saurav Sahay Oxford University Press

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VALUE ADDED COURSES

SYLLABUS

Session 2019-2020

COMPUTER SCIENCE
& ENGINEERING

CLOUD COMPUTING

SubCode: GNCSCC518   **Total Duration: 30Hrs.**

- Pre-requisites of course: Programming Skills, Familiarity with Databases, Basics of Security and Privacy, Knowledge of Agile Development, Basics of Networking is expected.

Course Objectives:

- Understand the concepts of cloud computing, virtualization and classify services of cloud computing
- Illustrate architecture and programming in cloud
- Define the platforms for development of cloud applications and list the application of cloud.
- Illustrate the use of generics and collections in cloud computing.

About Cloud Computing:.

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

In short, the cloud is the Internet, and cloud computing is techspeak that describes software and services that run through the Internet (or an intranet) rather than on private servers and hard drives.

Characteristics of cloud computing

- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

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Course Outcomes:		Knowledge Level, KL
Upon the completion of the course, the student will be able to:		
CO1	Identify the architecture, infrastructure and delivery models of cloud computing	K2
CO2	Apply suitable virtualization concept.	K3
CO3	Design Cloud Services	K3
CO4	Analyze a private cloud	K4

KL-Bloom's Knowledge Level (K1, K2, K3, K4, K5.K6)
K_1-Remember K_2- Understand K_3-Apply K_4.- Analyze K_5.- Evaluate K_6.- Create

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	**Introducing to Cloud Computing**	6
2	**Cloud Computing and Application Paradigms**	6
3	**Cloud Resource and Virtualization**	6
4	**Cloud Resource Management and Scheduling**	6
5	**Cloud Security and Cloud Application Development**	6

Total hours : 30

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Detailed Syllabus:

UNIT-I
Cloud computing, Cloud computing delivery models and services, Ethical issues, Cloud vulnerabilities, Cloud computing at Amazon, Cloud computing the Google perspective, Microsoft Windows Azure and online services.

UNIT-II
Challenges of cloud computing, Architectural styles of cloud computing, Workflows: Coordination of multiple activities, Coordination based on a state machine model.

UNIT –III
Virtualization, Layering and virtualization, Virtual machine monitors, Virtual Machines, Performance and Security.

UNIT-IV
Policies and mechanisms for resource management, Application of control theory to task scheduling on a cloud, Stability of a two-level resource allocation architecture, Feedback control based on dynamic thresholds.

UNIT V
Cloud security risks, Security: The top concern for cloud users, Privacy and privacy impact assessment, Trust, Operating system security, Virtual machine Security, Security of virtualization, Security risks posed by shared images.

Assessment:
1. Every student has to give 'test consisting of Cloud Computing tasks and Objective Questions.

Companies Using DOTNET

Companies ranging from automotive, banking, and software implement the Cloud software. The lists of companies using the Cloud Software are:

- Dropbox.
- Intel.
- RingCentral.
- Cisco Meraki.
- NetApp.
- Oracle.
- Salesforce.
- Workday.

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Text Books:

1. Rajkumar Buyya, Christian Vecchiola, and Thamarai Selvi Mastering Cloud. Computing McGraw Hill Education

Reference Books:

1.Dan C. Marinescu, Cloud Computing Theory and Practice, Morgan Kaufmann, Elsevier 2013.

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ADD-ON COURSES

SYLLABUS

Session2019-2020

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COMPUTER SCIENCE
& ENGINEERING

AI and ML

SubCode: AI and ML [GNCSAI718]   **Total Duration: 30Hrs.**

Pre-requisites of course: C Programming, Basics of Engineering Mathematics, basic knowledge of Python & data science is required. Basic computer literacy is expected.

Course Objectives:

- Outline basic introduction of Artificial intelligence and Machine Learning.
- Contrast on the Fundamentals of AI and ML
- Examine the algorithms used for AI and ML.
- Classify the different application used in AI AND ML.

About AI & ML

- Artificial Intelligence or AI, is a branch of computer science that deals with building smart machines that are capable of performing complex tasks that normally require human interference and intelligence. It combines Data Science with real-life data to leverage machines and computers to imitate the decision-making and problem-solving capabilities that the human mind has.

- Machine learning is a growing technology which enables computers to learn automatically from past data. Machine learning uses various algorithms for building mathematical models and making predictions using historical data or information. Currently, it is being used for various tasks such as image recognition, speech recognition, email filtering, Facebook auto-tagging, recommender system, and many more. This machine learning tutorial gives you an introduction to machine learning along with the wide range of machine learning techniques such as Supervised, Unsupervised, and Reinforcement learning. You will learn about regression and classification models, clustering methods, hidden Markov models, and various sequential models.

	Course Outcomes:	Knowledge Level, KL
	Upon the completion of the course, the student will be able to:	
CO1	Outline basic introduction of Artificial intelligence and Machine Learning.	K2
CO2	Contrast on the Fundamentals of AI and ML.	K2
CO3	Examine algorithms used for AI and ML.	K4
CO4	Classify the different application used in AI AND ML.	K4

KL-Bloom's Knowledge Level (K1, K2, K3, K4, K5.K6)

K_1-Remember K_2- Understand K_3-Apply K_4.- Analyze K_5.- Evaluate K_6.- Create

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Introduction artificial intelligence & Machine Learning	6
2	Intelligent Agent	6
3	Decision Tree Learning:	6
4	Instance-Base Learning	6
5	Bayesian Learning	6

Total hours: 30

Detailed Syllabus:

UNIT-I

What is artificial intelligence? Types of Artificial Intelligence Problems solving , problem spaces and search, Heuristic search Techniques

UNIT-II

Knowledge representation issues, Predicate logic, Representaiton knowledge using rules. Concept learning: Concept learning task, Concept Learning as search, Find-S algorithm, Candidate Elimination Algorithm, Inductive bias of Candidate Elimination Algorithm,

UNIT –III

Decision Tree Learning: Introduction, Decision tree representation, appropriate problems, ID3 algorith.Aritificil Nueral Network: Introduction, NN representation, appropriate problems, Perceptrons, Back propagation algorithm.

UNIT-IV

Bayesian Learning: Introduction, Bayes theorem, Bayes theorem and concept learning, ML and LS error hypothesis, ML for predicting, MDL principle, Bates optimal classifier, Gibbs algorithm, Navie Bayes classifier, BBN, EM Algorithm

UNIT V

Instance-Base Learning: Introduction, k-Nearest Neighbour Learning, Locally weighted regression, Radial basis function, Case-Based reasoning.Reinforcement Learning: Introduction, the learning task, Q-Learning.

Assessment:

After completion of one-week session comprising 30 hours, an MCQ based certification test of 2 hours will be conducted, students satisfying in the test will be provided a certificate signed by Head of the department and course in charge

Companies Using AI AND ML

The lists of companies in working AI & ML
- Google Cloud
- Neurala
- AWS
- Insitro
- IcarbonX
- Deep 6
- Tech mahindra

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Text Books:

1. Tom M Mitchell,**"Machine Lerning"**,1st Edition, McGraw Hill Education, 2017.

2. Elaine Rich, Kevin K and S B Nair, **"Artificial Inteligence"**, 3rd Edition, McGraw Hill Education, 2017.

Reference Books:

1.Saroj Kaushik, Artificial Intelligence, Cengage learning

2. Stuart Rusell, Peter Norving , Artificial Intelligence: A Modern Approach, Pearson Education 2nd Edition

3. AurÈlienGÈron,"Hands-On Machine Learning with Scikit-Learn and Tensor Flow: Concepts, Tools, and Techniques to Build Intelligent Systems", 1st Edition, Shroff/O'Reilly Media, 2017.

4. Trevor Hastie, Robert Tibshirani, Jerome Friedman, h The Elements of Statistical Learning, 2ndedition, springer series in statistics.

5. Ethem Alpaydın, Introduction to machine learning, second edition, MIT press.

6. Srinvivasa K G and Shreedhar, " Artificial Intelligence and Machine Learning", Cengage.

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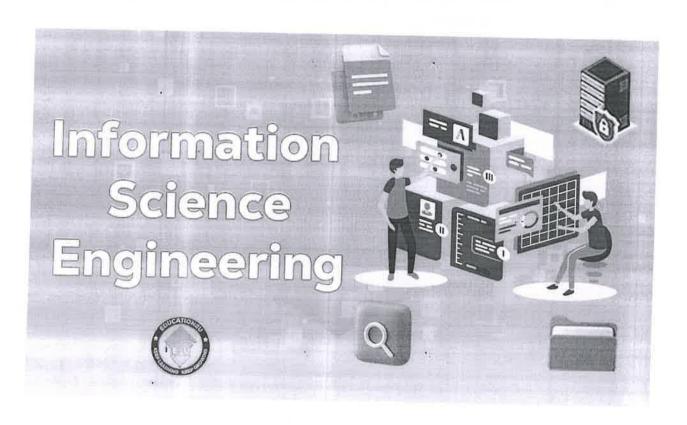## BIDAR, KARNATAKA

ADD-ON COURSES

SYLLABUS

Session 2019-20

VISUAL BASIC 6.0 (GNECVB21)

VISUAL BASIC

Module 1:

Introduction: Need of visual languages, integrated development environment (IDE), advantage of Visual Basic, characteristics and features of Visual Basic – IDE, Projects, user interface, objects oriented, visual development and event driven programming, forms/graphic controls, data processing, sharing with windows and internet applications. 6 Hrs

Module 2:

Visual Basic programming and tools: An introduction to Visual Basic programming, simple program construction, statements, input/outputs, comments, editor, subroutines, controls flow statements, objects and variants. 6Hrs

Module 3:

Designing user interface – elements of user interface, understanding forms, menus and toolbars, designing menus and toolbars, building dynamic forms, drag and drop operations, working with menus, customizing the toolbars. 6 Hrs

Module 4:

Controls – textbox, combo box, scroll bar and slider control operations, generating timed events, drawing with Visual Basic using graphics controls, coordinate systems and graphic methods, manipulating colors and pixels with Visual Basic, working with ActiveX controls. 6 Hrs

Module 5:

Menus: Creating a menu system, Creating and accessing pop-up menu, Modifying menus at runtime, adding menu items at run-time, data access methods, creating, reading and writing text files, data controls, creating queries. Report generation. 6 Hrs

Reference Books:

1. David Schneider, Introduction to Programming using Visual Basic, PHI.
2. Mohammed Azam, Programming with Visual Basic 6.0, Vikas Publications.
3. Dietel & Dietel, Visual Basic Programming, Pearson Education.
4. David I. Schneider, An Introduction To Programming Using Visual Basic .Net®, PHI.
5. C Muthu , Visual Basic.Net, Tata Mc Graw Hill Year of Publication.

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COURSE OBJECTIVES:

- Understand the basics of Programming.
- Understand functional hierarchical code generation.
- Understand the usage of characters, string, integers and special symbols in programming.
- Understand loops and decision-making statements in order to solve problems.
- Understand arrays and implementation of various operations on arrays.
- Understand the use of functions and pointer in programming.
- Understand the use of structure & union.
- Understand file operations and implement file operation in C programming for a set of problems.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Identify the need and use of programming in real world environment.
CO2	Improve the understanding of using data types, variables and arithmetic operations in programming.
CO3	Understand the concept of functions and pointer. In addition, resolve real world problems using functions and pointers.
CO4	Understand Array and String concepts and implement array and string using functions and pointers.
CO5	Exercise user defined data types including structure and union.

CO-PO MAPPING:

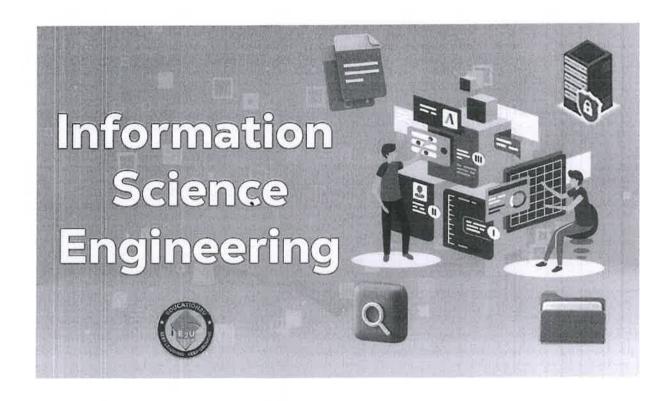| PO / CO	PO											
	POI	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1				1		1				
CO2		2	1	1	1							
CO3	1	3	2	2		2	1	2				
CO4	1	2	2	1	1		1					
CO5		2	2	1	1	3	1	1				

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ADD-ON COURSES

SYLLABUS

Session 2019-20

INTRODUCTION TO DOT NET FRAMEWORK FOR APPLICATION DEVELOPMENT (GNEC521)

INTRODUCTION TO DOT NET FRAMEWORK FOR APPLICATION DEVELOPMENT
Total Duration: 30hrs

Module-1

Introducing Microsoft Visual C# and Microsoft Visual Studio 2015: Welcome to C#, Working with variables, operators and expressions, Writing methods and applying scope, Using decision statements, Using compound assignment and iteration statements, Managing errors and exceptions

Module-2

Understanding the C# object model: Creating and Managing classes and objects, Understanding values and references, Creating value types with enumerations and structures, Using arrays.

Module-3

Understanding parameter arrays, Working with inheritance, Creating interfaces and defining abstract classes, Using garbage collection and resource management

Module-4

Defining Extensible Types with C#: Implementing properties to access fields, Using indexers, Introducing generics, Using collections

Module-5

Enumerating Collections, Decoupling application logic and handling events, Querying inmemory data by using query expressions, Operator overloading

Text Books:

1. John Sharp, Microsoft Visual C# Step by Step, 8th Edition, PHI Learning Pvt. Ltd. 2016

Reference books:

1. Christian Nagel, "C# 6 and .NET Core 1.0", 1st Edition, Wiley India Pvt Ltd, 2016. Andrew Stellman and Jennifer Greene, "Head First C#", 3rd Edition, O"Reilly Publications, 2013.
2. Mark Michaelis, "Essential C# 6.0", 5th Edition, Pearson Education India, 2016.
3. Andrew Troelsen, "Prof C# 5.0 and the .NET 4.5 Framework", 6th Edition, Apress and Dreamtech Press, 2012

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Course Objectives:

- Inspect Visual Studio programming environment and toolset designed to build applications for
- Microsoft Windows Understand Object Oriented Programming concepts in C# programming
            language.
- Interpret Interfaces and define custom interfaces for application.
- Build custom collections and generics in C#
- Construct events and query data using query expressions

Course Outcomes:

- Understand the Microsoft .NET Framework and ASP.NET page structure .Design web application with variety of controls
- Access the data using inbuilt data access tools.
- Use Microsoft ADO.NET to access data in web Application
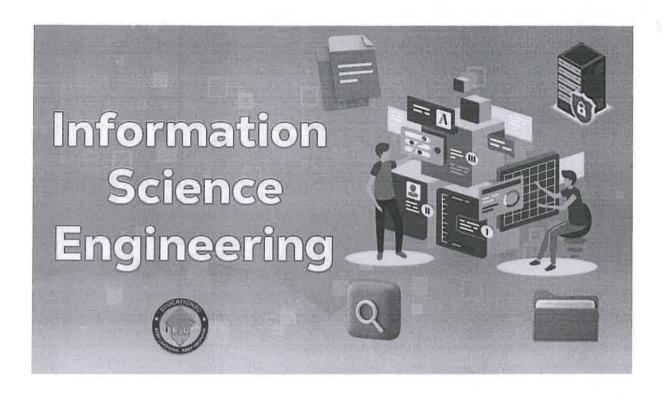- Configure and deploy Web Application.Develop secured web application

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ADD-ON COURSES

SYLLABUS

Session 2019-2020

SYSTEMS APPLICATIONS & PRODUCTS (SAP)

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SYSTEMS APPLICATIONS & PRODUCTS (SAP)   Total Duration: 30hrs

Module-1

SAP Overview: Introduction to ERP And SAP, History of SAP, Organization, Technology, Implementation Tools (Asap and Solution Manager),System Landscape, Roles And Responsibilities of a Consultant, Types of Projects, Change Transport System

Module-2

FINANCIAL ACCOUNTING: Overview of Organizational Elements in Accounting, Organizational Units,Define and Assign Organizational Units for Finance: Ex: – Country, Regions,,Company, Company Codes, Business Areas, Functional Areas, etc., Variant Principle,Fiscal Year and Posting Periods,Field Status Variants,Document types and NumberRanges,Posting Keys,Define Tolerance for GL Accounts and Employees,Global Parameters

Module-3

General Ledger: Master Data Overview, Chart of Accounts, Types of Chart of Accounts, Define and Assign Chart of Accounts, Define Account Groups and Screen Layout for GL Accounts, Define Retained Earnings Account, Creations of GL Accounts Master Records, Postings, Display GL Account Balances and Document.

Module-4

Currencies: Maintain Exchange Rates Maintain Table, Define Translation Ratios for Currency, Define Accounts for Exchange Rate Differences, Posting with Foreign Currency
Define Methods for Foreign Currency Valuation, Prepare Automatic Posting for foreign currency valuation, Revaluation of foreign currency balances
Taxes: Tax on Sales & Purchases, With Holding Tax (TDS), Country India Version (CIN)

Module-5

Currencies: Parking Document, Holding Document, Reference Document, Recurring Document, Sample Document, Account Assignment Model, Fast Data Entry
Bank Accounting:
Define House Banks with Bank Accounts, Creation of check number ranges for check lot
Define void reason codes, Issue of a check, Manual payment, Cancellation of issue check with reason codes, Check register

Reference books:

1.SAP ERP Financial Accounting And Controlling Configuration and Use Management 1st Edition, Kindle Edition by Andrew Okungbowa
2. Materials Management with SAP ERP: Functionality and Technical Configuration, SAP Press; Fourth edition by Martin Murray & Jawad Akhtar,

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Course Objectives:

- The aim of the course is to strengthen the capabilities of individuals and institutions involved in the SAP process.
- The SAP course will provide the necessary skills, information and approaches required to develop a SAP.
- Creates a centralized system for businesses that enables every department to access and share common data to create a better work environment for every employee in the company.
- SAPs are created with the stated goal of reducing the borrowing country's fiscal imbalances in the short and medium term or in order to adjust the economy to long-term growth.

Course Outcomes:

- The program enables individuals to stay up-to-date and relevant by becoming skilled in the latest SAP technologies and solutions.
- Certification provides personal and company recognition, and supports career progression from proficiency to mastery.
- Provides one to handle software presented by SAP towards better work process and data management in organizations.

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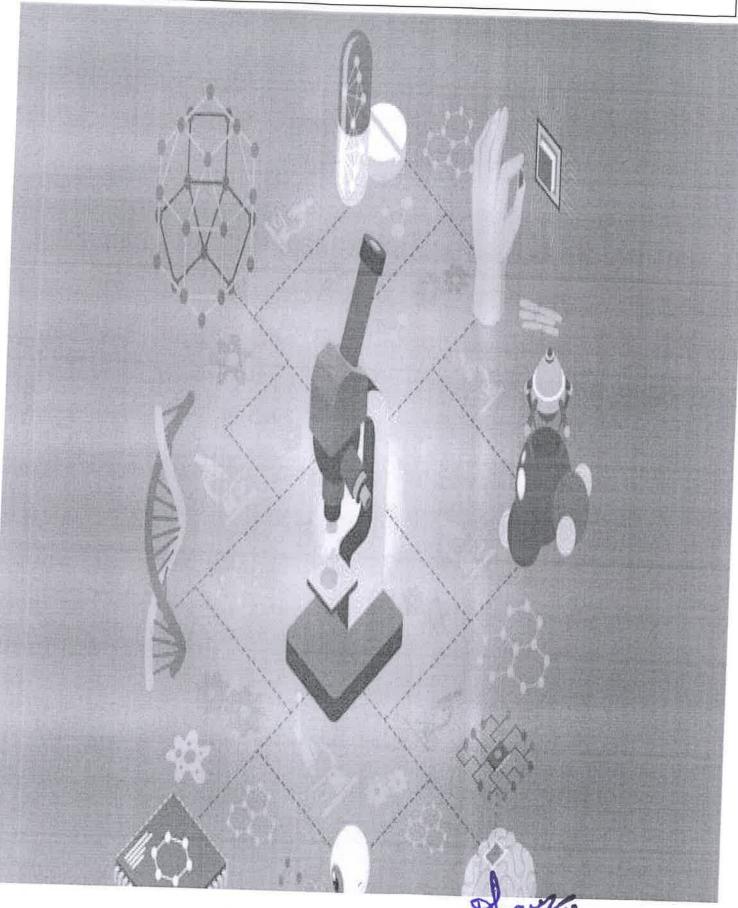
ADD-ON COURSES

SYLLABUS

Session2019-2020

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Guru Nanak Dev Engg. College, Bidar

Department of Applied Sciences & Humanities

NANOTECHNOLOGY

Course Objectives: Inthiscoursestudentswilllearnabout
1.Thebasicsofnanoscalescience
2. typesofmaterials,
3.theirengineeringapplicationsand hazards.

About **Nanotechnology**

Nanotechnology (NT) is the complex interdisciplinary science including nanoscience, nanochemistry, nanophysics, nanomaterials, nanoelectronics, nanometrology, nanobionics, etc. Nanotechnology is a relatively new branch of science that has found a wide range of applications that range from energy production to industrial production processes to biomedical applications. Nanomaterials (NMs) can be engineered to possess unique composition and functionalities, which can provide novel tools and techniques. In this chapter, we aim to discuss the key of many concepts from nanoscale, and nanostructures. Periodical development in nanotechnology and areas of study within nanotechnology have been discussed. The fundamental issues in nanomaterials are considered. We will attempt to correlate the improvements in the material properties that are achieved due to the fine microstructures arising from the size of the grains and/or dimensionality
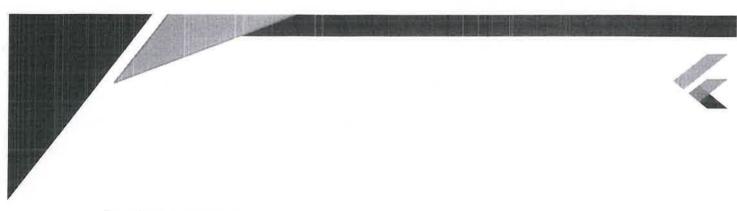
Course Outcomes:		Knowledge Level, KL
Upon the completion of the course, the student will be able to:		
CO1	Describefundamentalsofnanoscienceandnanotechnology;	K2
CO2	Classifynano-structures.	K2
CO3	Developsmartmaterials	K3,K6

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CO4	Analysebiomaterials	K4
CO5	Explainnanotoxicology.	K2

Knowledge Level (K1, K2, K3, K4, K5.K6)
K₁-Remember K₂- Understand K₃-Apply K₄.- Analyze K₅.- Evaluate K₆.- Create

Detailed Syllabus:

UNIT-I: INTRODUCTIONTONANOSCIENCEANDNANOTECHNOLOGY
History, background and interdisciplinary nature of nanoscienceand nanotechnology, challenges of Rechard Feynman, scientificrevolutions,nanosizedeffectssurfacetovolumeratio,examples of surface to volume ratio, atomic structure, Bohratomicmodel,moleculesandphases,introductiontoclassical

UNIT-IICLASSIFICATIONOFNANOSTRUCTURES
Zerodimensional,one-dimensionalandtwodimensionalnanostructurematerials-classificationofsolids:conductor,semiconductors,insulator,typesofsemiconductor,doping,diodes,currentflowinsemiconductors,ceramicsandnanocomposites,quantumsizeeffect(QSE)in1D,2D,3Dnanomaterials,quantumdots,nanowires,nanotubes, nanosheets,topdownandbottomupapproach.

UNIT –III: BIOMIMETICSANDBIOMATERIALS
Biomimetics: Biomimetics: lessons from nature – Introduction,Industrial significance, Lessons from nature and applications,overviewofvariousobjectsfromnatureandtheirselectedfunctions,Lotuseffect,Velcr

oeffect,biologicallyinspiredmechanisms,Biologicallyinspiredstructuresandtools,biologicalmaterials.

Biomaterials:Introduction,ClassificationofBiomaterials,Biomaterialsasimplantinhumanbody, characterizationof
biomaterials.

UNIT IV: INTRODUCTIONTONANOMATERIALSANDDEVICES:

Types of nanomaterials: Metal nanoparticles eg Au, Ag, Cu, Ptand their application as FETs.Metal oxide nanoparticles TiO_2,ZnO, SnO_2 and their application in solar cells, MEMS based gassensors, Semiconducting Cadmium and Selenide quantum dotsbio imaging, Carbon based nanomaterials and their applicationsinFETs,MOSFETS,sensorsandactuators,Siliconbasednanostructuresandtheirapplic ationinsingleelectronelectronics used as tips for AFM and Field emission microscopy,magneticandceramicsnanomaterialsandtheirapplication.

UNIT V:INTRODUCTIONTONANOTOXICOLOGY

Nanomaterialspollution–NanomaterialsinEnvironment-ToxicologyofAirborne–
EffectofNanomaterialsintheenvironment. Safety and pollution Control techniques-handling,storage,packaging,transportation anddisposal.

Assessment:

of the Course each student will give a presentation

References Book:

TEXTBOOKS:
1. EdwardL.Wolf,"NanophysicsandNanotechnology-AnIntroductiontoModernConceptsin Nanoscience" SecondEdition,JohnWiley & Sons,2006. 2. FoundationsofNanoscaleScienceandTechnology,ShareefrazaJ.Ukkund,PrasadPuthiyillam, LAP-Lambert Academic Publishing, Mauritius, 2018. ISBN: 978-613-958649-3Nanotechnology–BasicScience&EmergingTechnologies:2002byMichaelWilson,KamaliKannangara,Geoff Smith,MichelleSimmons,and Burkhard Raguse. 3. Nanoparticlestechnology:MasuoHosokawa,KiyoshiNogi,MakioNaito,Toyokazu Yokoyama,Firstedition2007,ISBN:978-0-444-53122-3.
REFERENCEBOOKS: 1. VladimirP.Torchilin(2006)NanoparticulatesasDrugCarriers,ImperialCollegePress. 2. M.RezaMozafari(2007)NanomaterialsandNanosystemsforBiomedicalApplications. 3. K.W.Kolasinski,"SurfaceScience:FoundationsofCatalysisand Nanoscience",Wiley,2002. 4. Biomimetics:lessonsfromnature–anoverview byBharathbhushan 5. Biomimetics—usingnaturetoinspirehumaninnovationYosephBar-Cohen.

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VALUE ADDED COURSES

SYLLABUS

Session 2019-2020

Department of MBA

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Detailed Syllabus:

Detail syllabus
UNIT-I
Knowing computer: Introduction, Concept of hardware and software, Components of computer system, Bringing computer to life, Concept of computing, data and information.

UNIT-II
MS-Office: MS-Word (Word Processing Software), MS-Excel (Spreadsheet Software), MS-PowerPoint (PresentationSoftware), MS-Access (Database Management Software), MS-Outlook (E-mail Client)

UNIT –III
Understanding word processing: Introduction, Word processing basics, Opening and closing documents, Table manipulation, Formatting the text, Text creation and manipulation.
Using spread sheet: Introduction, Elements of electronic spared sheet, Formulas and function, Manipulation of cells.

UNIT-IV
Communication using the internet: Introduction, Internet, Basics of computer networks
WWW and Web browser: Introduction, Understanding URL, World Wide Web (WWW), Surfing the web, Web browsing soft wares, Search engines,

UNIT V
Communication and collaboration: Basic of e-mail, Document collaboration, Using e-mails
Antivirus technique: Introduction, Virus, Program/File infector virus or parasitic virus, Antivirus software, Data Backup and Recovery Tools Recovery tools, Hacker and Cracker.

References Book

1. **Computer Fundamentals 1St Edition 2017 by RS Salaria, Khanna Publishing House**

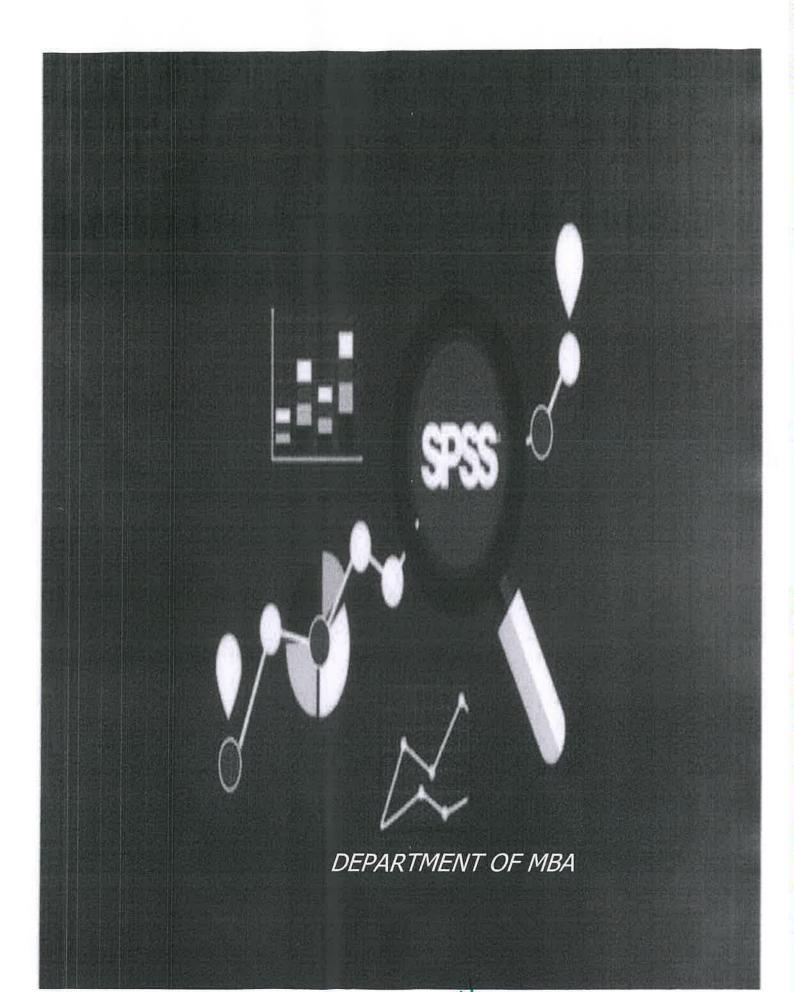2. Computer Awareness Kindle Edition by Arihant Experts, arihant publication

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ADD-ON COURSES

SYLLABUS

Session 2019-2020

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DEPARTMENT OF MBA

INTRODUCTION OF SPSS FOR DATA ANALYSIS

Total Duration: 30 Hrs.

Pre requisites of course : Basic computer literacy is expected, MS word and Excel and prior knowledge of basic statistics is required

Course objectives

1)To impart the knowledge to the students with SPSS version 25 software

2)To provide a working introduction to the SPSS Software

3)To introduce students to the use of various statistical tools like graphs,charts, descriptive statistics, ANOVA, Chi square test, Correlation, regression etc.(applying statistical tools for analyzing data from management point of view).

About SPSS

SPSS is a Windows based program that can be used to perform data entry and analysis and to create tables and graphs. SPSS is capable of handling large amounts of data and can perform all of the analyses covered in the text and much more. SPSS is commonly used in the Social Sciences and in the business world .IBM SPSS Statistics is a fast and powerful solution that propose research analysis in numerous industries. SPSS Statistics is used in education, market, research, healthcare, government and retail throughout the entire analytics process from planning and data collection to analysis, and deployment.

In market research ,there is growing pressure to deliver actionable insights to client who want to make informed business decision quickly and expect detailed strategic report within aggressive timelines .SPSS software helps in exploring relationships in data to predict outcomes.

Course outcomes

After the completion of the course the students will be able to

1) Understand the basics of IBM SPSS Software

2) Understand data files and reading excel data and text file

3) To demonstrate the data by applying descriptive statistics, chart, graphs

4) Demonstrate the data by applying, correlation, regression, chi-square test & Anova

5) To demonstrate the ability to evaluate and interpret the data analysis results.

Detailed Syllabus:

About SPSS software : SPSS is a Windows based program that can be used to perform data entry and analysis and to create tables and graphs. SPSS is capable of handling large amounts of data and can perform all of the analyses covered in the text and much more. SPSS is commonly used in the Social Sciences and in the business world

Module 1: Introduction   **05 hrs**

Learn about SPSS install and open SPSS, review layout of SPSS become familiar with Menus and Icons , exit SPSS

Module 2: Reading Data   **05 hrs**

Basic structure of IBM SPSS statistics data files , reading data file, reading excel data, reading data from database and text file..

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Module 3: Descriptive statistics   10 hrs
Descriptive statistics: Mean, sum, standard deviation, variance, range, Anova(Analysis of Variance) correlation, tables and charts, Regression, Running Analysis.

Module 4: Creating and editing charts.   06 hrs
Creating and editing charts, charts builder gallery, defining variables and statistics and adding text .

Module 5: Working with output   04hrs
Pasting results in word,excel and PowerPoint, exporting result to PDF.

References Book

1) *Darren George and Paul Mallery's* SPSS for Windows Step by Step – A Simple Guide and Reference 18.0 UPDATE – Eleventh Edition, *published by Pearson Education,*
2) arthur griffith-SPSS For Dummies –A Refernce for the Rest of Us

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