IARE

INSTITUTE OF AERONAUTICAL ENGINEERING

NAAC ACCREDITATION A++ GRADE

NBA NATIONAL BOARD OF ACCREDITATION

nirf INDIA RANKINGS 2023 | TOP 200 ENGINEERING RANK 151-200 | TOP 100 INNOVATION RANK 51-100

24 YEARS OF Excellence

B.TECH

INFORMATION TECHNOLOGY

BE INTELLIGENCE WITH IT
PART OF IT

JOIN THE FUTURE:

**ACADEMIC YEAR
2024-25**

→

VISION AND MISSION OF THE INSTITUTE

Program Educational Objectives (PEOs)

VISION

To bring forth students, professionally competent and socially progressive, capable of working across cultures meeting the global standards ethically.

MISSION

To provide students with an extensive and exceptional education that prepares them to excel in their profession, guided by dynamic intellectual community and be able to face the technically complex world with creative leadership qualities.

Further, be instrumental in emanating new knowledge through innovative research that emboldens entrepreneurship and economic development for the benefit of wide spread community.

PEO-I

To prepare the graduates for a successful career to meet the diversified needs of industry, academia and research.

PEO-II

Apply knowledge of societal impacts of information technologies in the course of their career related activities ethically and appropriately

PEO-III

To equip graduates with a solid foundation in discrete mathematical and engineering fundamentals required to develop problem solving ability in complex engineering design.

PEO-IV

To inculcate in graduates the qualities of leadership in technology innovation and entrepreneurship with effective communication skills, teamwork, ethics and to create ability for life-long learning needed in a successful professional career

VISION AND MISSION OF THE DEPARTMENT

VISION

The Department envisions to become a Center of Excellence in Information Technology with a strong teaching and research environment that produces competent graduates and to inculcate traits to make them not only good professionals but also kind, committed and socially oriented human beings.

MISSION

To promote a teaching and learning process that includes latest advancements in information technology, that provides strong practical base for the graduates to make them excellent human capital for sustainable competitive edge and social relevance by inculcating the philosophy of continuous learning and innovation in the core

Knowledge and Attitude Profile

WK1
A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2
Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3
A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4
Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5
Knowledge, including efficient resource use, environmental impacts, whole-life cost, reuse of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6
Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7
Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8
Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9
Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

Program Outcomes (POs)

PO-1 Engineering Knowledge
Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO-2 Problem Analysis
Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO-3 Design/Development of Solutions
Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO-4 Conduct Investigations of Complex Problems
Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO-5 Engineering Tool Usage
Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO-6 The Engineer and The World
Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO-7 Ethics
Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO-8 Individual and Collaborative Team work
Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO-9 Communication
Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO-10 Project Management & Finance
Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multi disciplinary environments.

PO-11 Life-Long Learning
Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

Program Specific Outcomes (PSOs)

PSO-I
Design next-generation computer systems, networking devices, search engines, soft computing and intelligent systems, web browsers, and knowledge discovery tools.

PSO-II
Focus on mobile and web applications development and learn the emerging technologies and frameworks in demand with employers and contemporary challenges.

PSO-III
Practical experience in shipping real world software, using industry standard tools and collaboration techniques will equip to secure and succeed in first job upon graduation in IT industry

ABOUT **INFORMATION TECHNOLOGY**

The field of information technology (IT) covers the design, administration and support of computer and telecommunications systems. Some of the positions in this field include database and network administrators, computer support specialists, computer scientists, software programmers and system analysts. The majority of career tracks in IT entail design and operational tasks related to computer hardware components, networks and software applications. This programme aims to equip graduates with the ability to apply the concepts and principles of Information Systems to support the design, development and management of Information Systems. The graduates will be able to design and develop Information Systems to suit the organizational needs using highest quality technology-based services, with high ethical values in the context of professional practice of computing.

Why study IT @ IARE

TOP 2 highest demand Bachelor program

Well trained experts in areas of Computing, Analytics, Cloud Computing, Communications, Cybersecurity, Data/database management, Infrastructure, Internet of things, Maintenance and repair, Networks, Robotics, Software/application development and SCADA.

- Well-equipped Laboratory facilities and conducive environment for students.

- International Exposure for students via mobility program and student exchange.

- Industry supported

- Information Technology has been applied in various critical sectors such as healthcare, communication, financial transactions, customer service, transportation and logistics, emergency response, healthcare monitoring, manufacturing and production, smart grids, social media and marketing, gaming and others.

- Information Technology in the program will expose students to Information Technology specific subjects such as Algorithms, Data Structures, Programming Languages, Computer Networks, Network Security, Web Technologies, including HTML, CSS, JavaScript, and frameworks like Node.js, React, or Angular, and several other elective subjects to choose from.

- Information Technology equips students with a solid foundation in computer science and IT principles, along with specialized skills and knowledge required for various IT roles in industry, research, and academia.

Expertise and focus:

We are committed to quality and excellence in research, engaging in both fundamental and applied research that focus on real world problems or issues. We emphasize on creating new knowledge and innovative products that make impact to thesociety, academia, government, industry and environment.

Other relevant high demands of research focus also may be not limited to:

Cybersecurity and Privacy

Cloud Computing

Internet of Things (IoT)

Computer Vision and Image Processing

Data Science and Big Data Analytics
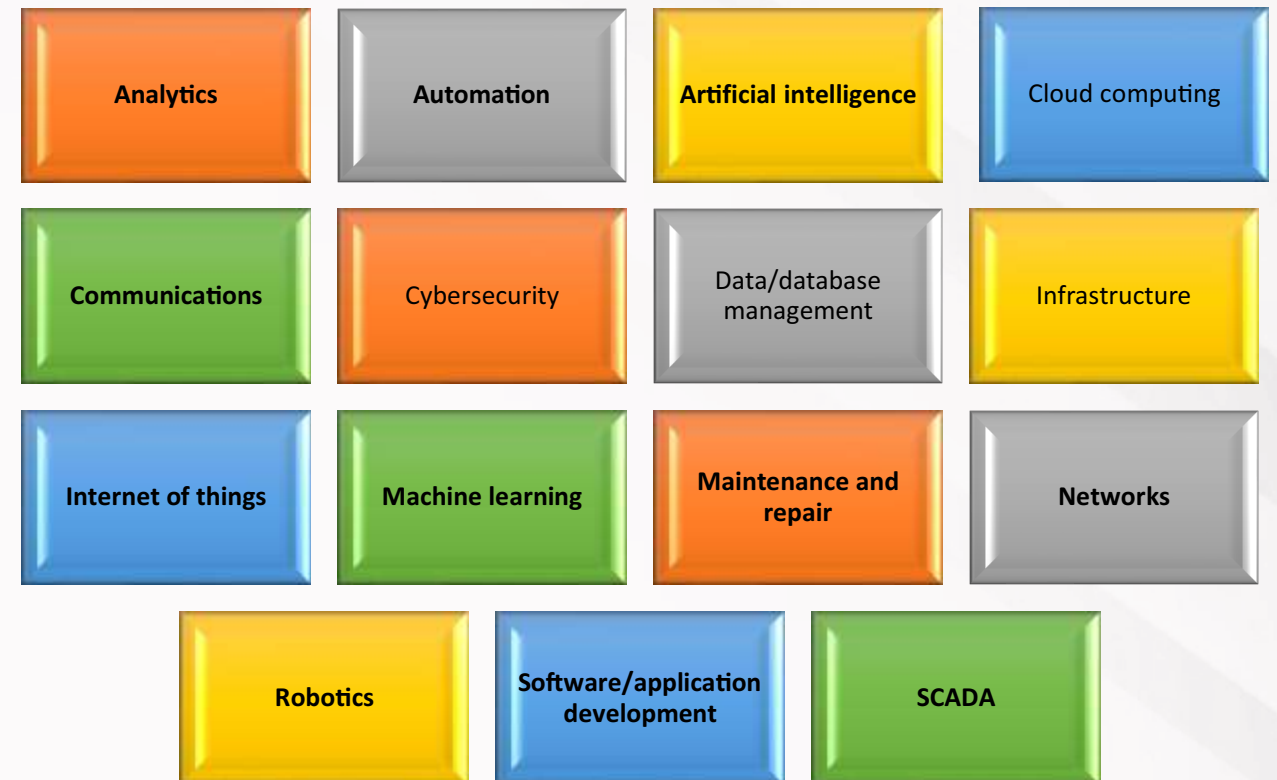
INFORMATION TECHNOLOGY

Information technology (IT) is the use of computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data. Typically, IT is used in the context of business operations, as opposed to the technology used for personal or entertainment purposes. The commercial use of IT encompasses both computer technology and telecommunications.
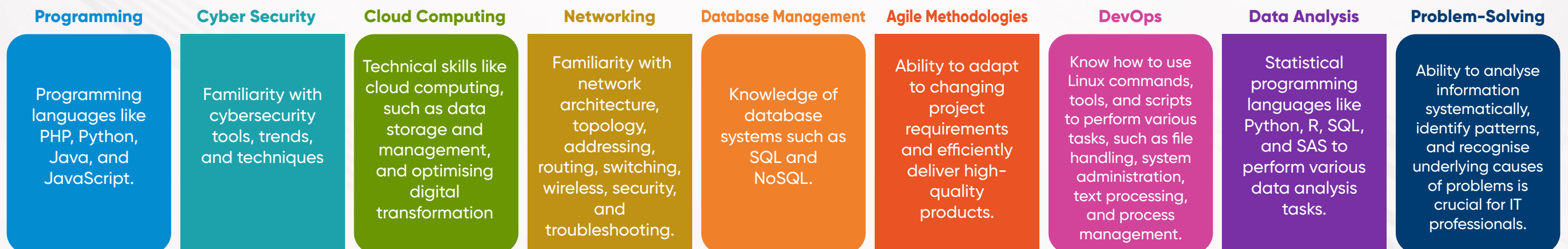

TYPES OF INFORMATION TECHNOLOGY:

Information technology is a broad term that involves the use of technology to communicate, transfer data and process information.

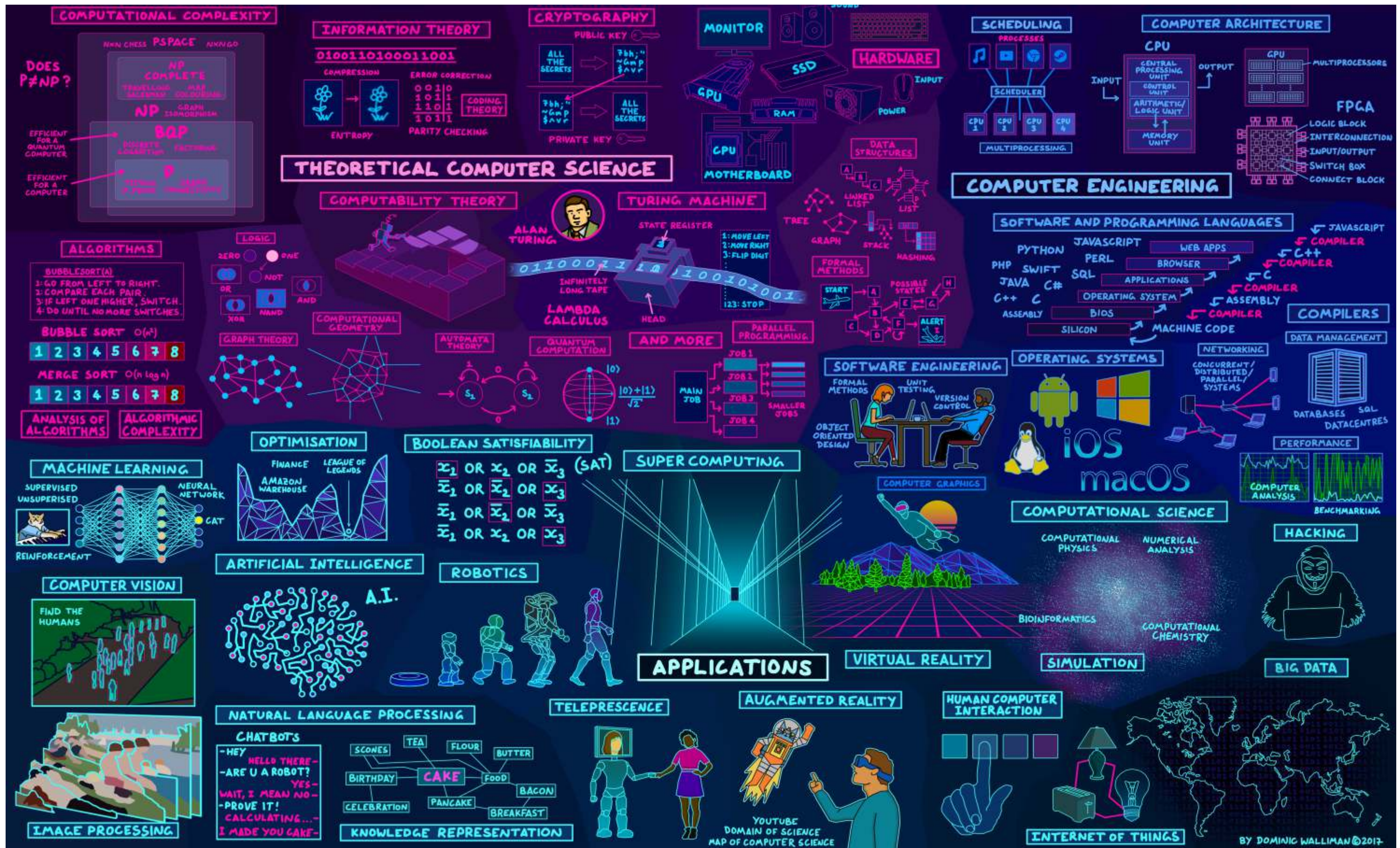The different trends within information technology include, but aren't limited to:

Analytics	Automation	Artificial intelligence	Cloud computing
Communications	Cybersecurity	Data/database management	Infrastructure
Internet of things	Machine learning	Maintenance and repair	Networks
Robotics	Software/application development	SCADA	

This list is by no means exhaustive and new applications for technology are constantly emerging

TOP 9 SKILLS FOR INFORMATION TECHNOLOGY PROFESSIONALS

Programming	Cyber Security	Cloud Computing	Networking	Database Management	Agile Methodologies	DevOps	Data Analysis	Problem-Solving
Programming languages like PHP, Python, Java, and JavaScript.	Familiarity with cybersecurity tools, trends, and techniques	Technical skills like cloud computing, such as data storage and management, and optimising digital transformation	Familiarity with network architecture, topology, addressing, routing, switching, wireless, security, and troubleshooting.	Knowledge of database systems such as SQL and NoSQL.	Ability to adapt to changing project requirements and efficiently deliver high-quality products.	Know how to use Linux commands, tools, and scripts to perform various tasks, such as file handling, system administration, text processing, and process management.	Statistical programming languages like Python, R, SQL, and SAS to perform various data analysis tasks.	Ability to analyse information systematically, identify patterns, and recognise underlying causes of problems is crucial for IT professionals.

MAP OF INFORMATION TECHNOLOGY

By Dominic Walliman ©2017

Specilized Laboratories
Cloud Application Development Centre:

IARE has a MoU with Manjra Soft Solution Pty Ltd. to establish an industry support Cloud Application Development Centre. The centre is focused on the creation of innovative software technologies for simplifying the development and deployment of applications on private or public Clouds. Aneka pltform plays the role of Application Platform as a Service for Cloud Computing. Aneka supports various programming models involving Task Programming, Thread Programming and MapReduce Programming and tools for rapid creation of applications and their seamless deployment on private or public Clouds to distribute applications.

Aneka technology primarily consists of two key components:

1. SDK (Software Development Kit) containing application programming interfaces (APIs) and tools essential for rapid development of applications. Aneka APIs supports three popular Cloud programming models: Task, Thread, and MapReduce.

2. A Runtime Engine and Platform for managing deployment and execution of applications on private or public Clouds.

IARE has Augment Reality/Virtual Reality center which provides students with hands-on experience in using cutting-edge technologies to visualize complex concepts, conduct experiments, and develop solutions to real-world problems. AR & VR labs can also foster creativity, collaboration, and critical thinking skills, which are essential for success in their careers. The center will engage in research, teaching and services for developing advanced methods and algorithms for near-real 3D user interfaces and exploratory data analysis in virtual environments.

Highlights of AnekaCenter:

1. Support of multiple programming and application environments
2. Simultaneous support of multiple run-time environments
3. Rapid deployment tools and framework
4. Simplicity in developing applications on Cloud
5. Dynamic Scalability
6. Ability to harness multiple virtual and/or physical machines for accelerating application result
7. Provisioning based on QoS/SLA

Aneka Architecture:

Aneka is a platform and a framework for developing distributed applications on the Cloud. Aneka provides developers with a rich set of APIs for transparently exploiting such resources and expressing the business logic of applications by using the preferred programming abstractions. The Aneka based computing cloud is a collection of physical and virtualized resources connected through a network, which are either the Internet or a private intranet
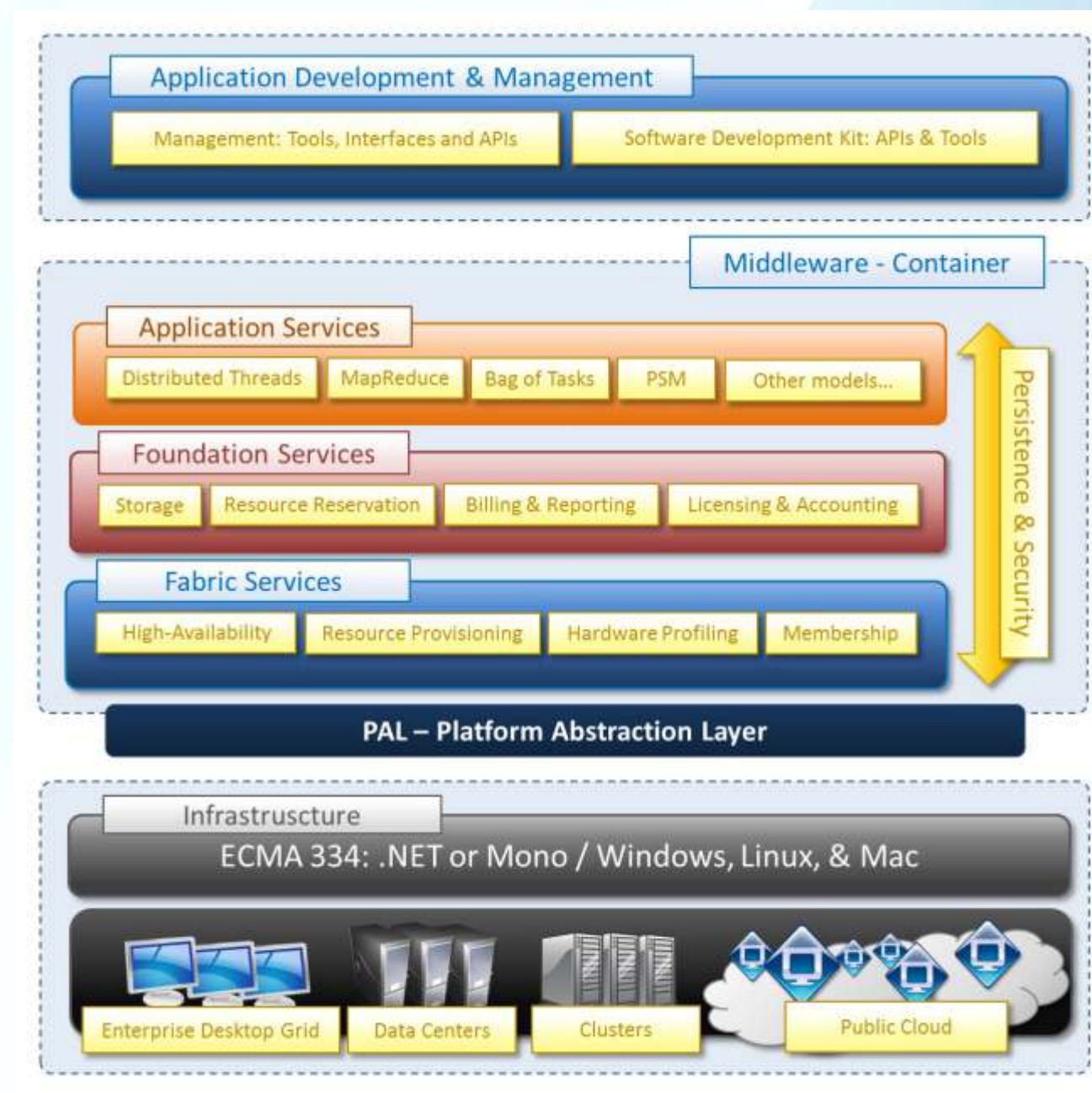
Data Science centre

Data Science Lab is configured which not only facilitates students to practice basic programming in C, C++, Python and JAVA; but also learn advanced technologies of computer science such as Machine Learning, Artificial Intelligence, Deep Learning and Data Mining. The Lab facilitates database designing and management through dedicated tools such as Oracle, and MySQL and related computing paradigm and frameworks.

It also provides computing platform for novel languages like Python, R, and OpenCV and other necessary for building coherent set of ideas, fundamental of Machine Learning, Artificial Intelligence and Deep Learning models and algorithms. Each lab sessions is aimed to translate the theory lectures into practical implementation through programming paradigms and tools, platforms provided in the data science lab. Data Science Lab welcomes students, researchers, interns, faculties and everyone from a broad range of disciplines who are fascinated with the possibilities of turning big and complex data to knowledge.

Members of the data science lab seeks cutting edge problem-based solutions to data mining, computer vision and machine learning problems arising in numerous application areas involving data analytics.

Objectives:

The long-term research agenda of the Data Science Lab is to develop new algorithms and software tools for data management and mining, and to use them for social good.

The Data Science Lab focuses on applying machine learning, data mining, and network analysis to real-world problems in society and industry.

Exploring the creation of novel statistical and computational methods for scalable data mining, machine learning, optimization as well as statistical modelling with complex data sets

We are especially interested in machine learning, data mining and information retrieval. In all of these areas, the combination of well-informed theoretical models empowered by large-scale resources allows for exciting insights and applications.
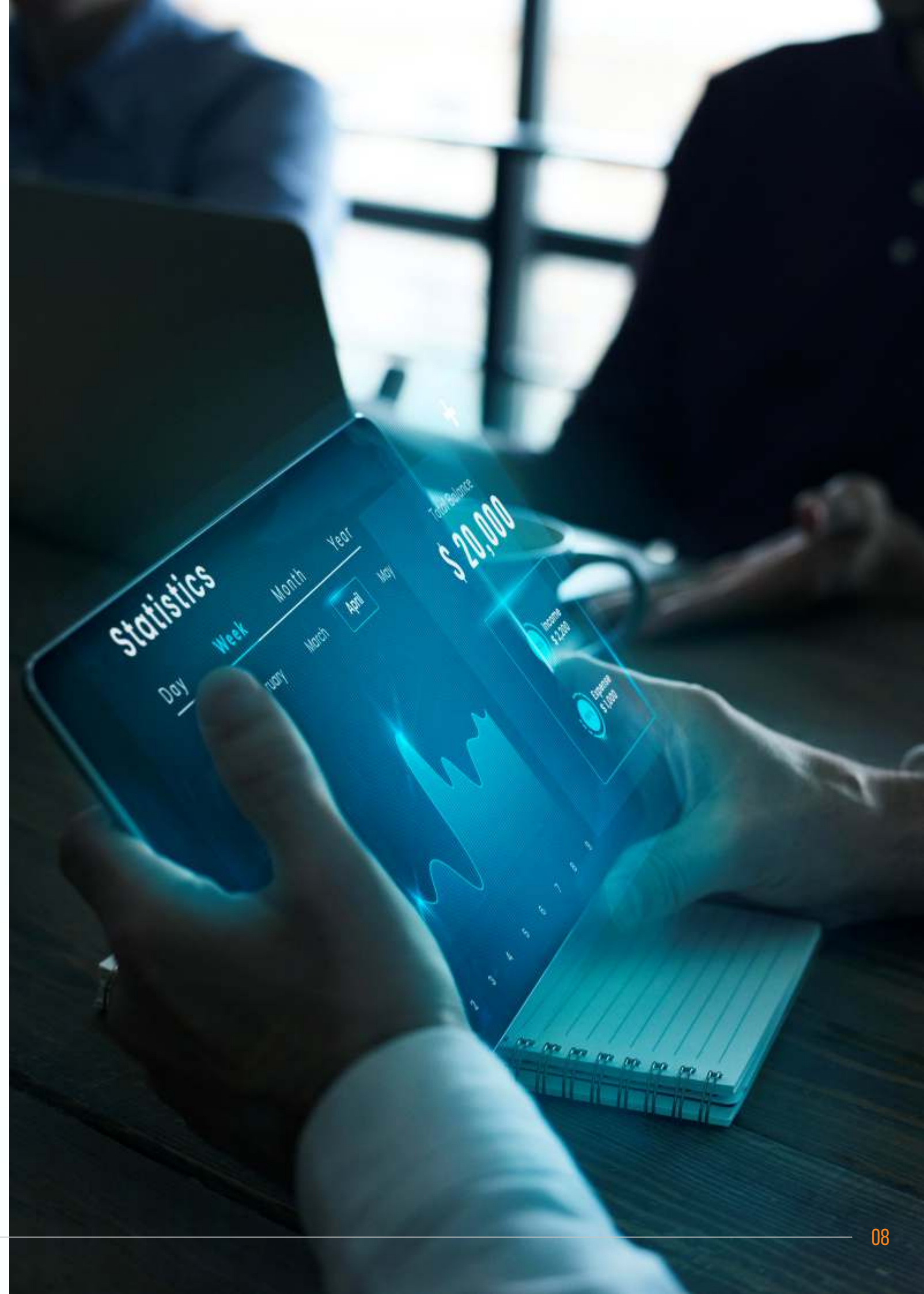
DEPARTMENT SPECIFIC LABORATORIES

1. Object Oriented Programming with Java Laboratory

This lab reinforces understanding of basic object oriented programming concepts (objects, classes and subclasses, methods) and their expression in Java. Students are able to analyze and design a computer program to solve real world problems based on object-oriented principles and able to write simple Graphical User Interface (GUI) interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles.

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Dell
Model: Vostro 3902
Processor: Intel Core i3-8100 CPU@ 3.60 GHz, 4 GB RAM, 1 TB HDD systems with 22" color monitor.
Software used: Netbeans 13, JDK 11.0.14 Open Source.

Programming For Problem Solving Laboratory

Programming for Problem Solving laboratory is designed to familiarize students with the basic components of programming, so as to be able to initiate the students into the discipline of Programming Languages. Through this lab student get the ability to design, develop, test and document structured programs in Python language. The expectation is that students will become self-sufficient in learning any programming language on their own thereafter.

2. Data Structures Laboratory

The objective of this laboratory is to provide practical learning on various data structures and to understand the processing of different algorithm for problem-solving. This laboratory complements the data structures and computer algorithms courses. It provides the requisite environment for design and analysis of algorithms for solving complex problems in the field of information technology. Students gain practical knowledge by writing and executing programs in python using various data structures and implementing algorithm principles

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel Core i3-7100 CPU@ 3.90 GHz, 4 GB RAM, 1 TB HDD systems with 18.5" color monitor
Software used: Python 3.10.4 Open Source.

3. Programming With Objects Laboratory

This laboratory reinforces understanding of basic object oriented programming concepts (objects, classes and subclasses, methods) and their expression in Java. Students are able to analyze and design a computer program to solve real world problems based on object-oriented principles and able to write simple Graphical User Interface (GUI) interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel Core i3-8100 CPU@ 3.60 GHz, 4 GB RAM, 1 TB HDD systems with 22" color monitor
Software used: Netbeans 13, JDK 11.0.14 Open Source.

4. Operating Systems Laboratory

Operating Systems Laboratory focuses on some of the design aspects of operating system concepts. It includes process scheduling, memory management, deadlocks, disk scheduling strategies, and file allocation methods. They will be able to design algorithms that are appropriate for problems that they might encounter in real life.

Major Equipment

Desktop Computer Systems– 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel core i3 – 4160 @3.60 GHz=/4 GB DDR3 RAM / 1 TB HDD / Keyboard/ Mouse / 18.5" Monitor
Software used: Python/iPython Notebook

5. Algorithms Laboratory

Students will be able to solve problems which are algorithm based by using various design techniques. They will be able to apply prior knowledge of standard algorithms to solve new problems, and mathematically measure and compare the performance of different algorithms. They will be able to produce concise technical writing for describing the solutions and arguing their correctness.

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel Core i3-7100 CPU@ 3.90 GHz, 4 GB RAM, 1 TB HDD systems with 18.5" color monitor
Software used: Python 3.10.4 Open Source

6. Web Systems Engineering Laboratory

The purpose of this lab is to develop the web applications through MVC architecture. The objective of the web technologies lab is to design web pages, client validations, server side scripting, data base connectivity. Through this lab the students can achieve an ability to design, implement and deploy static and dynamic web applications.

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel core i3-4150@3.50 GHz / 4 GB DDR3 RAM / 500 GB / Keyboard / Mouse / 18.5" monitor
Software Required: XAMP Server

7. Database Management Systems Laboratory

The requirement of modern days is to have an automated system that manages, modifies and updates data accurately. This is achieved by a Database Management System (DBMS) in robust, correct and non redundant way. Through DBMS laboratory, students will get knowledge about the database environment and a way to manage data. Students are made familiar with Oracle Software. Students will also be trained to do certifications in Oracle and .Net Technologies.

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel Core i3-7100 CPU@ 3.90 GHz, 4 GB RAM, 1 TB HDD systems with 18.5" color monitor
Software Required: Oracle 11g Open Source

8. Artificial Intelligence Laboratory

The Artifical Intelligence Laboratory focuses on knowledge-sharing and management can help organizations automate tedious tasks, provide actionable insights, and enable faster decision-making. In this lab, we will explore practical AI applications that can enhance knowledge-sharing and management.

Major Equipment

Desktop Computer Systems 36 Nos

Make: Lenovo
Model: M70C
Configuration: Intel core i5 - 10500 @ 3.10GHz / 16GB DDR3 RAM / 1TB SATA HDD / Keyboard and Mouse / 22" Monitor
Software Required: Python / iPython Notebook

9. Cloud Application Development laboratory

The Cloud computing laboratory focuses on users accessing storage, data, software, and server from any internet-connected device, including PCs, smart phones, tablets, and wearable devices. Cloud computing, in its most basic form, refers to the capacity to store and access data and applications through the internet rather than on a local computer. This laboratory implements various virtualization tools such as Virtual Box, VMware workstation. This laboratory teaches students to know the design and development process involved in creating cloud-based applications

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel Core i3-7100 CPU@ 3.90 GHz, 4 GB RAM, 1 TB HDD systems with 18.5" color monitor.
Software Required: VMware, Hadoop 3.2.3, Globus Tool Kit Open Source

10. Computer System Internals And Linux Laboratory

The purpose of this laboratory is to introduce the students to LINUX kernel programming techniques In this laboratory students are able to describe and use the fundamental LINUX system tools and utilities. Problems in the field of networking, data structures and system software can be easily built on Linux platform because of the various inbuilt system calls available in Linux. Thus the main objective of the Linux laboratory is to make the students aware of the features and capabilities of Linux so that they can utilize its improved functionalities to develop new Linux based software and can also contribute to the development of the operating system itself.

Major Equipment

Desktop Computer Systems 36 Nos

Make: Dell
Model: Vostro 3902
Configuration: Intel Core i3-7100 CPU@ 3.90 GHz, 4 GB RAM, 1 TB HDD systems with 18.5" color monitor
Software Required: Ubuntu 20.04.4 LTS Open Source

11. Machine Learning And Neural Computing Laboratory

The aim of this laboratory is to train a model on historical, labelled data (i.e., data for which the outcome is known) in order to predict the value of some quantity on the basis of a new data item for which the target value or classification is unknown. Machine learning and Neural Computing is able to leverage large amounts of data to infer complex patterns that are otherwise beyond the capabilities of rule-based systems and human experts. Its application to laboratory medicine is particularly exciting, as laboratory testing provides much of the foundation for clinical decision making.

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Lenovo
Model: M70C
Configuration: Intel core i5 - 10500 @ 3.10GHz / 16GB DDR3 RAM / 1TB SATA HDD / Keyboard and Mouse / 22" Monitor
Software Required: Ubuntu 20.04.4 LTS Open Source

12. Computing Things Laboratory

Operating Systems Laboratory focuses on some of the design aspects of operating system concepts. It includes process scheduling, memory management, deadlocks, disk scheduling strategies, and file allocation methods. They will be able to design algorithms that are appropriate for problems that they might encounter in real life.

Major Equipment

Desktop Computer Systems– 36 Nos

Make: Lenovo
Model: M70C
Configuration: Intel core i5 - 10500 @ 3.10GHz / 16GB DDR3 RAM / 1TB SATA HDD / Keyboard and Mouse / 22" Monitor
Software used: Proteus VSM software

13. Security Protocol And Laboratory

Security Protocol and Laboratory focuses on diagnose various protocol message details like TCP/UDP using Wireshark. NetSim is used to simulate the features of IP routing, transport layer flow and congestion control, data link layer protocol modelling over CSMA/CD. In network programming, students develop programs to understand the client server model. Special emphasis is given on advanced topics like high request throughput (including ability to scale), multiplexing, buffering, stream/datagram based communication. Students implement a three tier application(client browser, apache2 WebServer, MySQL DB) and study the implementation options.

Major Equipment

Desktop Computer Systems – 36 Nos

Make: Lenovo
Model: M70C
Configuration: Intel core i5 - 10500 @ 3.10GHz / 16GB DDR3 RAM / 1TB SATA HDD / Keyboard and Mouse / 22" Monitor
Software used: Python / iPython Notebook.

FACULTY
INFORMATION

Dr. M Purushotham Reddy
Head of the Department

Ph.D (2019), Doctoral Degree,
JNTUA, Anantapur

M.Tech (2009), JNTUA, Anantapur

AREA OF SPECIALIZATION

Image processing, Cyber Security and
Machine Learning

Dr. U Sivaji
Deputy Head of the Department

Ph.D (2022), Doctoral Degree,
Andhra University, Visakhapatnam

M.Tech (2003), JNTUH, Hyderabad

AREA OF SPECIALIZATION

Software Engineering,
Computing and Machine Learning

Dr. P L Srinivasa Murthy
Professor

Ph.D (2017), Doctoral Degree,
JNTUK, Kakinada

M.Tech (2007), JNTUA, Anantapur

AREA OF SPECIALIZATION

Computer Networks & Information Security

Dr. B Rama Devi
Professor

Ph.D (2016), Doctoral Degree,
Acharya Nagarjuna University, Guntur

M.Tech (2007), Vinayaka,
Deemed to be University, Tamil Nadu

AREA OF SPECIALIZATION

Network Security and Cryptography

Dr. T Chalama Reddy
Professor

Ph.D (2016), Doctoral Degree,
S V University, Tirupathi

M.Tech (2000), JNTUH, Hyderabad

AREA OF SPECIALIZATION

Network Security and Cryptography

Dr. Basetty Mallikarjuna
Professor

Ph.D (2018), Doctoral Degree,
Bharathair University, Coimbatore

M.Tech (2009), VIT, Vellore

AREA OF SPECIALIZATION
Computer Networks and
Machine Learning

Dr. S Satheesh Kumar
Associate Professor

Ph.D (2018), Doctoral Degree,
Anna University, Chennai

M.Tech (2010), Anna University, Chennai

AREA OF SPECIALIZATION
Computer Networks,
Artificial Intelligence, Machine Learning
and Cloud Computing.

Dr. M Pala Prasad Reddy
Associate Professor

Ph.D (2019), Doctoral Degree, NIT, Calicut

M.Tech (2009), NIT, Calicut

AREA OF SPECIALIZATION

Soft Computing Techniques,
Instrumentation & Control Systems

Dr. Ravi Kumar Poluru
Assistant Professor

Ph.D (2021), Doctoral Degree, VIT, Vellore

M.Tech (2014), JNTUA, Anantapur

AREA OF SPECIALIZATION

Optimization Techniques,
Machine Learning

Assistant Professors

- Ms. K Laxminarayanamma
- Ms. B Pravallika
- Ms. C S L Vijaya Durga
- Mr. S Vinod Kumar
- Ms. A Rajitha
- Ms. S Swarna Keerthi
- Ms. B Varasree
- Ms. K Venkata Ramana Devi
- Mr. N Raghava Rao
- Mr. R Suvarna Rao
- Ms. D Koumudi Prasanna
- Ms. N Venkata Sireesha
- Ms. M Hima Bindu
- Mr. Vinesh Gone
- Mr. Etteboina Raju
- Mr. Ch Sai Kiran Reddy
- Mr. A Karthik

COURSE MENU

Curriculum is designed based on professional modules from Microsoft, Alibaba, Huawei, CTS ,IEEE, ACM, and AICTE Model Curriculum in several subjects and so that students have opportunity to obtain professional certificates from the companies upon graduation.

I SEMESTER

Course Code	Course Name	Credit	Pre-requisite
INDUCTION PROGRAM			
AHSD01	Professional Communication	3	English
AHSD02	Matrices and Calculus	4	Mathematics
AEED01	Elementsof Electrical and Electronics Engineering	3	Physics
ACSD01	Object Oriented Programming	3	-
PRACTICAL			
AHSD04	Professional Communication Laboratory	1	Professional Communication
ACSD02	Object Oriented Programming with Java Laboratory	2	Object Oriented Programming
AMED02	Manufacturing Practice	2	-
AEED03	Electrical and Electronics Engineering Laboratory	1	Elements of Electrical and Electronics Engineering
EXPERIENTIAL ENGINEERING EDUCATION (ExEED)			
ACSD03	Essentials of Innovation	1	-
MANDATORY COURSE			
AHSD06	Environmental Science		-
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	20	

II SEMESTER

Course Code	Course Name	Credit	Pre-requisite
THEORY			
AHSD03	Engineering Chemistry	3	Chemistry
AHSD07	Applied Physics	3	Physics
AHSD08	Differential Equations and Vector Calculus	4	Mathematics
ACSD05	Essentials of Problem Solving	3	-
PRACTICAL			
AHSD05	Engineering Chemistry Laboratory	1	Engineering Chemistry
AHSD09	Applied Physics Laboratory	1	Applied Physics
ACSD06	Programming for Problem Solving Laboratory	2	Essentials of Problem Solving
AMED03	Engineering Graphics	2	-
SKILL ENHANCEMENT PROJECT			
ACSD04	Mobile Applications Development	1	-
MANDATORY COURSE			
AHSD10	Gender Sensitization		-
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	40	

III SEMESTER

Course Code	Course Name	Credit	Pre-requisite
THEORY			
AECD04	Digital Design and Embedded Systems	3	-
ACSD08	Data Structures	3	Essentials of Problem Solving
ACSD09	Computer Architectures and Operating Systems	3	Python Programming
AITD01	Mathematics for Computing	3	Python Programming
AHSD11	Probability and Statistics	4	Matrices and Calculus
PRACTICAL			
ACSD11	Data Structures Laboratory	1	Data Structures
AITD02	Programming with Objects Laboratory	1	Object Oriented Programming
ACSD10	Operating Systems Laboratory	1	Programming for Problem Solving
EXPERIENTIAL ENGINEERING EDUCATION (ExEED)			
ACSD12	Prototype and Design Building	1	-
VALUE ADDED COURSE			
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	60	

IV SEMESTER

Course Code	Course Name	Credit	Pre-requisite
THEORY			
ACSD13	Design and Analysis of Algorithms	3	Essentials of Problem Solving, Data Structures
ACSD14	Web Systems Engineering	3	Object Oriented Programming
ACSD15	Object Oriented Software Engineering	3	Object Oriented Programming
AITD03	Database Management Systems	3	Essentials of Problem Solving, Data Structures
AITD04	Computer Networks	3	Operating Systems
PRACTICAL			
ACSD16	Design and Analysis of Algorithms Laboratory	1	Data Structures
ACSD17	Web Systems Engineering Laboratory	1	Programming for Problem Solving
AITD05	Database Management Systems Laboratory	1	Data Structures
SKILL ENHANCEMENT PROJECT			
ACSD18	DevOps Engineer #	2	-
VALUE ADDED COURSE			
INTERNSHIP			
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	80	

V SEMESTER

Course Code	Course Name	Credit	Pre-requisite
THEORY			
ACSD19	Data Mining and Knowledge Discovery	3	Database Management Systems
ACCD04	Information Security Management	3	Computer Networks
ACSD20	Cloud Application Development	3	-
ACSD21	Artificial Intelligence	3	Data Structures
	Program Elective – I	3	-
PRACTICAL			
ACSD26	Artificial Intelligence Laboratory	1	Data Structures
ACSD27	Cloud Application Development Laboratory	1	Operating Systems
SKILL ENHANCEMENT PROJECT			
ACSD29	Engineering Design Project	1	-
ACSD30	(Skill) #	2	-
VALUE ADDED COURSE			
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	100	

#The course would consist of talks by working professionals from industry, government, academia & research organizations.

VI SEMESTER

Course Code	Course Name	Credit	Pre-requisite
THEORY			
ACSD31	Theory of Computation	3	Data Structures
ACSD32	Machine Learning and Neural Computing	3	Matrices and Calculus
	Program Elective – II	3	-
	Program Elective – III	3	-
	Open Elective - I	3	-
PRACTICAL			
ACSD41	Computer System Internalsand Linux Laboratory	1	-
ACSD42	Machine Learning and Neural Computing Laboratory	1	Programming for Problem Solving
SKILL ENHANCEMENT PROJECT			
ACSD44	Data Scientist / AI Specialist #	2	-
ACSD45	Development Project	1	-
VALUE ADDED COURSE			
INTERNSHIP			
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	120	

#The course would consist of talks by working professionals from industry, government, academia & research organizations.

VII SEMESTER

Course Code	Course Name	Credit	Pre-requisite
THEORY			
AITD19	Cyber Physical Systems	3	-
ACSD46	Compiler Construction	3	Data Structures
	Program Elective - IV	3	-
	Program Elective - V	3	-
	Open Elective - II	3	-
PRACTICAL			
ACSD54	Computing Things Laboratory	1	Computer System Internals and Linux
ACSD55	Security Protocol and Laboratory	1	Computer Networks
PROJECT WORK			
AITD27	Project Work (Phase - I)	3	-
MANDATORY COURSE			
AHSD14	Essence of Indian Traditional Knowledge		-
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	140	

VIII SEMESTER

Course Code	Course Name	Credit	Pre-requisite
THEORY			
AHSD15	Managerial Economicsand Financial Analysis	3	-
	Program Elective - VI	3	-
	Open Elective - III	3	-
PROJECT WORK			
AITD33	Project Work (Phase - II)	11	-
	TOTAL CREDITS	20	
	CUMULATIVE CREDITS	140	

ELECTIVE **COURSES**

PROGRAM ELECTIVES COURSES (PEC)

The below listed courses are Professional electives and the student has to study six courses as professional electives.

Course Code	Name of the Course	Prerequisites	Preferred Semester	Credits
AITD06	Advanced Data Structures and Algorithms	Data Structures	V	3
AITD07	Media Engineering		V	3
AITD08	Introduction to Communication System		V	3
AITD09	Computer Graphics		V	3
ACSD24	Digital Signal Processing	Matrices and calculus	V	3
ACCD05	Computer Vision	Matrices and calculus, data structures	VI	3
AITD10	Social Networks		VI	3
ACSD34	Introduction to Robotics	Matrices and calculus	VI	3
AITD11	Natural Language Processing		VI	3
AITD12	Quantum Computing		VI	3
AITD13	High Performance Computing	Essentials of Problem Solving	VI	3
AITD14	Game Theory		VI	3
AECD19	Microprocessor and Microcontrollers		VI	3
AITD15	Real Time Systems	Operating System	VI	3
AITD16	Agile Development and Scrum Practices		VI	3
AITD20	Big Data - Tools and Techniques		VII	3
AITD21	Data Analytics		VII	3
AITD22	Software Testing and Debugging	Object Oriented Software Engineering	VII	3
ACSD25	Software Project Management	Object Oriented Software Engineering	VII	3
ACDD23	Reinforcement Learning		VII	3
AITD23	Multimedia Systems		VII	3
ACDD25	Deep Learning Techniques		VII	3
AITD24	Network Automation	Computer Networks	VII	3
AITD25	Text Mining		VII	3
AITD26	Web Mining		VII	3
ACAD14	Human Computer Interaction (UI & UX)		VIII	3
ACSD57	Blockchain Technology	Programming, data structures	VIII	3
AITD28	Computer Forensics		VIII	3
AITD29	Ethical Hacking and Cyber Security	Computer Networks	VIII	3
AITD30	Cyber SecuritOy	Computer Networks	VIII	3

HONOURS

Course Code	Name of the Course	Prerequisites	Credits
HCSC01	Parallel Computer Architecture	Computer Organisation	3
HCSC02	Advanced Computer Architecture	Computer Architecture	3
HCSC03	An Introduction to Artificial Intelligence	Data Structures, Probability	3
HCSC04	Basics of Computational Complexity	Theory of Computation	3
HCSC05	Machine Learning for Engineering and science applications	Linear Algebra, Probability, Statistics	3
HCSC06	Advanced Computer Networks	-	3
HCSC08	Technical Paper Writing		

MINORS

Course Code	Name of the Course	Prerequisites	Credits
MCC001	Privacy And Security in Online social media	Python	3
MCC002	Computer Networks and Internet Protocol	-	3
MCC003	Foundations of Cyber Physical Systems	Basic Programming Knowledge	3
MCC004	Foundations of Cryptography	Discrete mathematics	3
MCC005	Advanced Computer Networks	Computer Networks	3
MCC006	Blockchain and its Applications	Computer Networks	3
MCC007	Introduction To Industry 4.0 And Industrial Internet Of Things	Basic knowledge of computer and internet	3
MCC008	Affective Computing	Artificial Intelligence	3
MCC009	Data Analytics with Python	-	3
MCC010	GPU Architectures And Programming	Data Structure	3
MCC011	Secure Computation: Part I	-	3

OPEN ELECTIVE COURSES (OEC)

Course Code	Name of the Course	Prerequisites	Credits
AITD17	Cloud & Grid Computing	-	3
AITD18	Computer Graphics and Multimedia Systems	-	3
ACSD52	Machine Learning for Engineering Applications	-	3
ACSD53	Soft Computing	-	3
AITD31	E-Commerce	-	3
AITD32	Visualizations and Animations	-	3

Competency building Courses

→ AR/VR Solutions
→ Software Engineering testing
→ Software Engineering an industry approach
→ Sales force
→ C# and .Net
→ Mobile Application Development
→ Pega
→ AWS
→ Azure
→ Machine Learning
→ Advanced Robotics
→ Block Chain
→ Data Analytics
→ Cyber Security

Career Development Courses:

→ Competitive Programming
→ JAVA Full Stack Developer
→ DevOps
→ Cloud Application Development
→ Database Design
→ Computer Networks
→ Puzzle
→ Aptitude and Reasoning
→ Professional Communication & Soft Skills

The components of curriculum is divided as follows

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits
Basic Sciences	11.87	21	19
Basic Engineering	11.25	23	18
Humanities and Social Sciences	2.5	5	4
Program Core	41.87	79	67
Program Electives	11.25	18	18
Open Electives	5.62	09	09
Project(s)	8.75	28	14
Any other (Skill)	6.87	19	11
Total number of credits			160

IARE
EDUCATION FOR LIBERATION

COURSE **SYNOPSIS**

CORE **COURSES** -

Data Structures

This course emphasis on data structure concepts theoretically and practically with detail algorithms for each of data structure. Students will learn abstract data type concepts using class and apply the concept in the implementation of data structures. Apart from it, student will learn recursive concept as a programming style and algorithm efficiency analysis with Big O notation. Various sorting and searching techniques will be discussed as data structure operations. Analysis of each algorithm will also be explained. Further, students will be exposed to linear data structures such as linked lists, stack and queue. Non-linear data structures such as tree and binary search tree will be discussed. Along the course, students should be able to implement and apply the theory and concepts of data structure in the assignments and mini project which are conducted in group.

Computer Architectures and Operating Systems

This course was designed to give the understanding of basic concept of computer organization and architecture. Topics covered in this subject will be on computer performance, types of data and the representative, arithmetic manipulation, instruction execution, micro programmable control memory, pipelining, memory, input/output and instruction format. At the end of this course, the student should be able to understand the concept of overall computer component and realize the current technology in computer hardware.

Mathematics for Computing

Computer science depends up on the science of mathematics, in order to acquire the knowledge in computing, mathematical ideas are required. Course is to provide a clear understanding of the concepts that underlying fundamentals with emphasis on their applications to computer science. It highlights mathematical definitions and proofs as well as applicable methods. The contents include formal logic notation, proof methods; induction, well- ordering; sets, relations; growth of functions; permutations and combinations, counting principles, recurrence equations.

Probability and Statistics

This course is designed to introduce some statistical techniques as tools to analyse the data. In the beginning the students will be exposed with various forms of data. The data represented by the different types of variables are derived from different sources; daily and industrial activities. The analysis begins with the data representation visually. The course will also explore some methods of parameter estimation from different distributions. Further data analysis is conducted by introducing the hypothesis testing. Some models are employed to fit groups of data. At the end of course the students should be able to apply some statistical models in analysing data using available software.

ACSD13: Design and Analysis of Algorithms

Design and analysis of algorithms is the process of finding the computational complexity of algorithms. It helps to design and analyze the logic on how the algorithm will work before developing the actual code for a program. It focuses on introduction to algorithm, asymptotic complexity; sorting and searching using divide and conquer, greedy method, dynamic programming, backtracking, branch and bound. NP-hard and NP-complete problems. The applications of algorithm design are used for information storage, retrieval, transportation through networks, and presentation to users.

ACSD14: Web Systems Engineering

This course introduces students to create concurrently a web app and a native app (for Android and iOS) with React Native and React Native Web. It covers HTML for structuring and presenting content on the World Wide Web. CSS being used to format structured content. To create a dynamic and interactive experience for the user it covers JAVASCRIPT. To build the applications using React concepts such as JSX, REDUX and PHP.

ACSD15: Object Oriented Software Engineering

This course concentrates on developing basic understanding about various activities that are involved in a software development. This course enables the student to develop necessary skills for developing a product or applications. The course focuses on all activities involved in software development (communication, planning, modelling, construction, deployment). In this course; students will gain a broad understanding of the discipline of software engineering and its application to the development and management of software systems. Student can implement and get knowledge about development of the software and gains knowledge of basic engineering methods and practices, and their appropriate application.

AITD03: Database Management Systems

This course introduces students to the concept of database system and how it is used in daily human life and profession. The focus of the course is to equip students with the knowledge and skills on important steps and techniques used in developing a database, especially in the conceptual and logical database design phase. Among topics covered are database environment, database design, entity relationship diagram, normalization, and structured query language (SQL). Students will be taught to use a database management system (DBMS). Students are required to design and develop the database component of an information system using the learned techniques, DBMS and a development tool. At the end of the course, students should be able to apply the knowledge of designing and developing a good database system.

Computer Networks

This course will discuss the routing and switching concepts in computer networking specifically in local area network (LAN). The course starts with the architecture, components and operation of routers and switches and furthermore discusses the operation of Virtual LAN (VLAN), Access control list (ACL) and Network Address Translation (NAT).

Information Security Management

The course is aimed at imparting knowledge and skill sets required to assume the overall responsibilities of administration and management of security of an information system. This course covers issues related to administration, management and governance of security of information systems.

Cloud Application Development

In this course, we are going to learn about common cloud misconfigurations, how to perform a risk assessment and verify compliance for various Cloud Services. Further, we will delve deeper into identifying security risks in these cloud services and to implement best practices to mitigate the common cloud misconfigurations. Other topics include topics of data ownership, privacy protections, data mobility, quality of service and service levels, bandwidth costs, data protection, and support.

Artificial Intelligence

This course offers students a new perspective on the study of Artificial Intelligence (AI) concepts. The essential topics and theory of AI are presented, but it also includes practical information on data input and reduction as well as data output (i.e. algorithm usage). In particular, this course emphasizes on theoretical and practical aspects of various search algorithms, knowledge representations, and machine learning methods. The course features practical implementations through assignments undertaken both individually and in groups.

Machine Learning and Neural Computing

The objective of this course is to enabling the student with basic knowledge on the techniques to build an intellectual machine for making decisions behalf of humans. This course covers the techniques on how to make learning by a model, how it can be evaluated, what are all different algorithms to construct a learning model. This course provides an introduction to the theory and implementation of neural networks and an understanding of the important computational neural network architecture and methodology. This course aims to provide a concise but rigorous overview over the whole field with focus on explaining the fundamental principle that empowers NNs, as well as diving into some widely-applied NN models.

Cyber Physical Systems

The objective of this course is to develop an exposition of the challenges in implementing a cyber-physical system from a computational perspective, but based equally on the principles of automated control. The course aims to expose the student to real world problems in this domain and provide a walk through the design and validation problems for such systems. With the advent of AI techniques, their increased use in CPS is also a promising growth vertical along with the necessity of safety assurance.

Compiler Construction

Compiler Construction provides an in-depth treatment of programming language translation, compilation, and run-time systems, organised around a significant programming project to build a compiler for a simple, but non-trivial core programming language. The course Topics include data structures for tree languages; lexical analysis, syntax analysis and abstract syntax; symbol tables and semantic analysis; translation, intermediate code, basic blocks and traces; machine targets and instruction selection; graph colouring, register allocation, dataflow analysis, optimisation, dynamic compilation. Upon completion of the course students will understand how programs map to execution on modern processors, and the impact of language design on language implementation.

ers that are hosted on the internet instead of the computer's hard drive or local server. Cloud computing is also referred to as Internet-based computing, it is a technology where the resource is provided as a service through the Internet to the user. The data that is stored can be files, images, documents, or any other storable document. cross. As is evident from the name, it gives the computer that which makes it more similar to humans: The ability to learn. Machine learning is actively being used today, perhaps in many more places than one would expect.

PROFESSIONAL **ELECTIVES**

Advanced Data Structures and Algorithms

The course covers some of the general-purpose data structures and algorithms, and software devel- opment. Topics covered include managing complexity, analysis, static data structures, dynamic data structures and hashing mechanisms. The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter in real life. This course reaches to student by power point presentations, lecture notes, and lab which involves the problem solving in mathematical and engineering areas.

Media Engineering

This course introduces students to overview of the development of media technology from the development of the printing press and relates the parallel advances in media communications and culture with technology development., Be able to discuss the methodologies of the engineering and media design professions, Analyze the reasons for media successes and failures in the marketplace, where technology innovation intersects with consumer and industry needs.

Introduction to Communication System

This course provides the student with the fundamental skills to analyze and solve analog communication problems on a system level. It will build mathematical background for communication signal analysis. Students equipped with the knowledge and training provided in the course will be able to participate in design and development, installation and operation of a wide spectrum of applications in the area of communications.

Computer Graphics

Computer graphics is one of the fundamental aspects of any computing system. The fundamental concepts and algorithms that underpin computer graphics are covered in this course, along with a brief overview of more advanced subjects like computer animation, image-based rendering, and global illumination. 2D and 3D geometrical transformations. Other topics covered include surface shading, ray tracing, hidden surface elimination algorithms, triangle and polygon rasterization, line drawing algorithms, circle/ellipse drawing algorithms and additionally, Installation of software supporting to OpenGL and executing practical programs.

Digital Signal Processing

The primary objective of this course is to provide a thorough understanding and working knowledge of design, implementation and analysis of DSP systems. To make students familiar with the most important methods in DSP, including digital filter design, transform-domain processing and importance of Signal Processors. To make students aware about the meaning and implications of the properties of systems and signals.

Computer Vision

The principle aim of the course is that the students will have Principle of Computer Vision, Perception of 2 Dimensional & 3Dimensional Transformation and Application: Tonal adjustment, 4D to 11D Transformation on CV. Moreover, analysis Edges, Edge detection, Edge linking and Application: Edge editing and enhancement, and comparative study of CFs., besides, it helps out the students to Edge Flow Propagation and Boundary Detection and Implementation of a method for tracking a set of unique features over time.

Social Networks

This course provides students an introduction to the study of social networks. The course will revolve around the study of some well-known theories of social and information networks and their applications on real world datasets. This course introduces students to a variety of existing, new and emerging concepts, strategies, and technologies utilized in today online environment. It covers various social networking platforms, content, and tools, and related security and privacy issues in social media. Students will learn how to use social media to reach personal and professional goals.

Introduction to Robotics

This course introduced to basics of modeling, design, planning, and control of robot systems. In essence, this syllabus treated in this course is a brief survey of relevant results from geometry, kinematics, statics, dynamics, and control. It deals with the design, construction, and use to control robots, sensory feedback and information processing. These are some technologies which will replace humans and human activities in coming years. These robots are designed to be used for any purpose but these are using in sensitive environments like bomb detection, deactivation of various bombs etc. Robots can take any form but many of them have given the human appearance. The robots which have taken the form of human appearance may likely to have the walk like humans, speech, cognition and most importantly all the things a human can do. Most of the robots of today are inspired by nature and are known as bio-inspired robots. Robotics is that branch of engineering that deals with conception, design, operation, and manufacturing of robots.

Natural Language Processing

This course aims to provide a comprehensive view of building real-world natural language processing (NLP) applications. The diverse applications of NLP are based on a common set of ideas, drawing on algorithms, linguistics, logic, statistics, and more. This course focuses on a compact set of methods unified by the concepts of learning and search, which can solve a remarkable number of problems in NLP. Employing specialized libraries, students develop applications for topic modeling, sentiment analysis, and text summarization.

Quantum Computing

The aim of this course is to give students a basic overview of the rapidly growing field of Quantum Computation (QC). The course also addresses limitations of quantum algorithms and introduces the necessary tools and techniques to prove the same. In order to compare QC and classical computing, simple quantum algorithms with their complexity analysis will be presented. This course also highlighting the recent development of the field in secure delegated QC.

High Performance Computing

This course will introduce students to the fundamental ideas of scientific computing on high performance architectures. The principal objective of this course is to enable students to use high performance computers in all aspects of scientific computing to support research activities. At the end of the class, you should be able to: design and implement efficient algorithms for high performance computing related to a variety of research areas, use MPI, OpenMP and other special tools used to program large multi-processor computers, understand the basic operating principles of these machines and analyze the performance of your codes.

Game Theory

Game theory teaches us how to think strategically: it is a method of analysis used to study, and guide, decision-making in environments where there is mutual interdependence. Information economics helps us analyze situations in which one agent has greater information than another agent with whom it interacts. This course surveys and develops concepts and techniques of game theory and information economics and their applications to issues of business strategy, including advertising and pricing decisions, negotiation and bargaining situations, entry deterrence games, etc.

Microprocessor and Microcontrollers

To provide solid foundation on the fundamentals of microprocessors and applications, interfacing the external devices to the processor according to the user requirements thus, enabling to create novel products and solutions for real time problems. The course also introduces the basic concepts of microprocessor and to develop in students the assembly language programming skills and real time applications of Microprocessor as well as microcontroller.

Real Time Systems

The course provides a solid foundation in object-oriented programming concepts in using them. It includes concepts object-oriented concepts such as information hiding, encapsulation, and polymorphism. It contrasts the use of inheritance and composition as techniques for software reuse. It provides an understanding of object- oriented design using graphical design notations such as Unified Modeling Language (UML) as well as object design patterns.

Agile Development and Scrum Practices

The overall goal of the course is to provide learners with the fundamentals of what Agile and Scrum are, and how to effectively apply Agile methods in your projects. This course provides a high-level conceptual overview of the concepts, principles and practices that are the foundation of both Agile practices in general and Scrum in particular. The Agile mindset – the practices, thinking and perspectives brought to bear in an Agile approach – have consistently proven to be effective and efficient in responding to complex and changing challenges and situations. This course is a walkthrough of the SCRUM Agile methodology to provide students with an understanding of how Agile thinking is implemented in SCRUM as well as an understanding of how SCRUM is supposed to work.

Data Analytics

This course will cover fundamental algorithms and techniques used in Data Analytics. Students learn to gather, analyze, and interpret data to drive strategic and operational success in technology-based companies. Develop skills to make data-based decisions with uncertain or ambiguous conditions, and develop models for decision-making in a business setting.

Software Testing and Debugging

The course will describe the basic techniques for testing and tools that can be used to perform automatic and manual testing for generating and validating test data. It will provide deeper insights into domain testing, path testing, transaction flow testing and transition testing. This course is used in the applications of banking system, library management, hotel management etc.

Software Project Management

The main goal of software development projects is to create a software system with a predetermined functionality and quality in a given time frame and with given costs. For achieving this goal. models are required for determining target values and for continuously controlling these values. This course focuses on principles, techniques, methods & tools for model-based management of software projects. Assurance of product quality and process adherence (quality assurance), as well as experience-based creation & improvement of models (process management).

Reinforcement Learning

This course is intended for students interested in artificial intelligence. Reinforcement learning is an area of machine learning where an agent learns how to behave in an environment by performing actions and assessing the results. Reinforcement learning is how Google DeepMind created the AlphaGo system that beat a high-ranking Go player and how Alpha Star become the first artificially intelligent system to defeat a top professional player in StarCraft II. We will study the fundamentals and practical applications of reinforcement learning and will cover the latest methods used to create agents that can solve a variety of complex tasks, with applications ranging from gaming to finance to robotics.

Multimedia Systems

The objective of this course is to provide students with the knowledge and understanding of media representation, storage, communication, and processing by digital means, with an emphasis on audio, still images, and video media. It includes an introduction to sampling theory and various representation techniques. This is used to describe and explain a variety of real devices, formats, and standards.

Deep Learning Techniques

This course is an elementary introduction to a machine learning technique called deep learning (also called deep neural nets), as well as its applications to a variety of domains, including image classification, speech recognition, and natural language processing. This course is to introduce students through some of the latest techniques in deep learning. The focus of the course will be hands on and the students should be able to design intelligent deep learning systems for solving the problems in the area of their interests.

Network Automation

Network automation is the use of IT controls to supervise and carry out everyday network management functions. It plays a key role in network virtualization technologies and network functions. This course starts by providing an introduction to network automation, SDN, and various applications of network automation, which include integrating DevOps tools to automate the network efficiently and guides through different network automation tasks and covers various data digging and reporting methodologies, such as IPv6 migration, DC relocations, and interface parsing, all the while retaining security and improving data center robustness. It also covers the importance of Ansible for network automation, including best practices in automation, ways to test automated networks using different tools, and other important techniques.

Text Mining

The overall aim of the course is to provide an introduction to quantitative analysis of text, with special focus on applying machine learning methods to text documents. The student will learn all the main steps when working with text: efficient extraction of text, natural language processing of the text in a form suitable for statistical machine learning methods which are subsequently used for, among other things, text prediction.

Web Mining

Web Mining is the process of Data Mining techniques to automatically discover and extract information from Web documents and services. The main purpose of web mining is discovering useful information from the World-Wide Web and its usage patterns.

Human Computer Interaction (UI & UX)

This course is an introduction to Human-Computer Interaction (HCI), a discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. The course considers the inherently multi- and interdisciplinary nature of HCI and situates various HCI issues in the organizational and societal contexts. It introduces theories of human psychology, principles of computer systems and user interfaces designs, a methodology of developing effective HCI for information systems, and issues involved in using technologies for different purposes. It is intended to give students an overview of the entire HCI field by covering most aspects of it. This course will thus provide a background for students to practice system design, selection, installation, evaluation, and use with the knowledge of human characteristics, interaction styles, use context, task characteristics, and design processes.

Blockchain Technology

This course will introduce the technical foundations of blockchain and its applications to a wide range of industries including finance, computer science, supply chain, smart power grid and social networking. The Objective of this course is to provide students with the required knowledge to conduct research in blockchain and basic skills to design smart contracts and implement distributed applications.

Ethical Hacking and Cyber Security

The course is intended to inculcate the importance of ethical hacking & cyber-security apart from creating awareness about various types of threats that may jeopardize data integrity. Students shall also learn how the hackers think and plan, along with all tools and techniques used in cyber-attacks.

Cyber Security

Cyber Security was designed to help learners develop a deeper understanding of modern information and system protection technology and methods. The learning outcome is simple: We hope learners will develop a lifelong passion and appreciation for cyber security, which are certain will help in future endeavors. Students, developers, managers, engineers, and even private citizens will benefit from this learning experience. Special customized interviews with industry partners were included to help connect the cyber security concepts to live business experiences.

Cloud & Grid Computing

In this course, students able to understand how Grid computing helps in solving large scale scientific problems. Gain knowledge on the concept of virtualization that is fundamental to cloud computing. This course covers how to program the grid and the cloud and also understand the security issues in the grid and the cloud environment.

Computer Graphics and Multimedia Systems

This course provides an introduction to the principles of computer graphics. In particular, it considers methods for modeling 2-dimensional objects and how it generates photorealistic renderings on color raster graphics devices. The emphasis of the course will be placed on understanding how the various elements that like geometry, algorithms and data structures interact in the design of graphics software systems. It also gives idea about basic building blocks of multimedia and a study about how these blocks sew together with current technology and tools.

Machine learning for Engineering Applications

This course aims to provide a broad overview of modern algorithms in ML, so that engineers may apply these judiciously. Towards this end, the course will focus on broad heuristics governing basic ML algorithms in the context of specific engineering applications. This course provides an introduction to machine learning with a special focus on engineering applications. The course starts with a mathematical background required for machine learning and covers approaches for supervised learning (linear models, kernel methods, decision trees, neural networks) and unsupervised learning (clustering, dimensionality reduction), as well as theoretical foundations of machine learning (learning theory, optimization).

Soft Computing

This course will cover fundamental concepts used in Soft computing. The concepts of Fuzzy logic (FL) will be covered first, followed by Artificial Neural Networks (ANNs) and optimization techniques using Genetic Algorithm (GA). Applications of Soft Computing techniques to solve a number of real life problems will be covered to have hands on practices. In summary, this course will provide exposure to theory as well as practical systems and software used in soft computing.

Find out more:
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