

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
(An Autonomous Institute)



Affiliated to

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, UTTAR PRADESH, LUCKNOW



Evaluation Scheme & Syllabus
For

Bachelor of Technology

Computer Science and Engineering (Internet of Things)

Fourth Year

(Effective from the Session: 2026-27)

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

Computer Science and Engineering (IOT)
Evaluation Scheme
SEMESTER -VII

Sl. No.	Subject Codes	Subject Name	Type of Subject	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	TOTAL	PS	TE	PE		
1	BCSIOT0701	Wireless Sensor Networks	Mandatory	3	0	0	30	20	50		100		150	3
2		Departmental Elective –V	Department Elective	3	0	0	30	20	50		100		150	3
3		Open Elective –II	Open Elective	3	0	0	30	20	50		100		150	3
4		Open Elective –III	Open Elective	3	0	0	30	20	50		100		150	3
5	BCSIOT0751	Wireless Sensor Networks Lab	Mandatory	0	0	2				25		25	50	1
6	BCSE0759	Summer Internship Assessment	Mandatory	0	0	2				50			50	1
7	BCSE0758	Capstone Project-I	Mandatory	0	0	4				50		50	100	2
8		MOOCs	*MOOCs											
		TOTAL		12	0	8	120	80	200	125	400	75	800	16
Summer Internship (4 weeks) shall be conducted during summer break after VI semester and will be assessed during VII semester														

Abbreviation Used:

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., PE: Practical End Semester Exam, CE: Core Elective, OE: Open Elective, DE: Departmental Elective, CA: Compulsory Audit,

MOOCs: Massive Open Online Courses.

*** List of MOOCs (Infosys) -Based Recommended Courses for Fourth -Year B. Tech Students**

S. No.	Subject Code	Course Name	University/ Industry Partner Name	N. of Hours	Credits
1.	BMC0111	Deep Learning for Developers	Infosys Wingspan (Infosys Springboard)	34h 51m	2.5
2.	BMC0138	Spring Boot and Angular-React Stack-DevOps Tools and Capstone Project	Infosys Wingspan (Infosys Springboard)	107h 50m	4

List of Department Elective (if any): -

S. No.	Subject Code	Subject Name	Bucket Name	Department Elective	Semester
1	BCSE0712	RPA Implementation	CRM-RPA	V	VII
2	BCSAI0712	Business Intelligence	Data Analytics	V	VII
3	BCSE0713	Web Development using MERN Stack with DevOps	Full Stack Development	V	VII
4	BCSAI0711	IoT for Smart Cities	IoT for Smart Cities	V	VII

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

Computer Science and Engineering (IOT)

Evaluation Scheme

SEMESTER VIII

Sl. No.	Subject Codes	Subject Name	Type of Subject	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	TOTAL	PS	TE	PE		
1		Open Elective-IV	Open Elective	2	0	0	30	20	50		50		100	2
2	BCSE0858/ BCSE0859	Capstone Project / Industrial Internship	Mandatory	0	0	16				200		200	400	8
		MOOCs (For B.Tech. Hons. Degree)	*MOOCs											
		TOTAL		2	0	16	30	20	50	200	50	200	500	10

*** List of MOOCs (Infosys) Based Recommended Courses for Fourth -Year B. Tech Students**

S. No.	Subject Code	Course Name	University/ Industry Partner Name	N. of Hours	Credits
1.	BMC0163	Data Processing and Visualisation	NASSCOM	15h	1
2.	BMC0066	Artificial Intelligence	Infosys Wingspan (Infosys Springboard)	69h 39m	4
3.	BMC0011	Building Machine Learning Systems with TensorFlow	Infosys Wingspan (Infosys Springboard)	27h 18m	2

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MOOCs: Massive Open Online Courses.

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AICTE Guidelines in Model Curriculum:

A student will be eligible to get Under Graduate degree with Honours only, if he/she completes the additional MOOCs courses such as Infosys Springboard/NASSCOM/CISCO (as applicable) certifications, or any other online courses recommended by the Institute (Equivalent to 20 credits). During Complete B.Tech. Program Guidelines for credit calculations are as follows.

1. For 6 to 12 Hours =0.5 Credit
2. For 13 to 18 =1 Credit
3. For 19 to 24 =1.5 Credit
4. For 25 to 30 =2 Credit
5. For 31 to 35 =2.5 Credit
6. For 36 to 41 =3 Credit
7. For 42 to 47 =3.5 Credit
8. For 48 and above =4 Credit

For registration to MOOCs Courses, the students shall follow Infosys Springboard/NASSCOM/CISCO (as applicable) registration details as per the assigned login and password by the Institute these courses may be cleared during the B. Tech degree program (as per the list provided). After successful completion of these MOOCs courses, the students shall provide their successful completion status/certificates to the Controller of Examination (COE) of the Institute through their coordinators/Mentors only.

The students shall be awarded Honours Degree as per following criterion.

- i. If he / she secures 7.50 as above CGPA.
- ii. Passed each subject of that degree program in the single attempt without any grace.
- iii. Successful completion of MOOCs based 20 credits



NIET
Greater Noida
Autonomous Institute

Noida Institute of Engineering & Technology, Greater Noida

नोएडा अभियांत्रिकी एवं प्रौद्योगिकी संस्थान, ग्रेटर नोएडा

(An Autonomous Institute)

Approved by AICTE, Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow Uttar Pradesh, (Formerly Uttar Pradesh Technical University)



Course Code: BCSIoT0701	Course Name: Wireless Sensors Network	L	T	P	C
Course Offered in: CSE(IoT)		3	0	0	3

Pre-requisite: Computer Networks, IoT Protocols

Course Objectives:

1. To understand the fundamentals of wireless communication and wireless sensor networks.
2. To study the architecture and design of wireless sensor nodes.
3. To learn MAC protocols and routing techniques used in WSNs.
4. To understand infrastructure establishment, synchronization, localization, and security issues in WSNs.
5. To explore various real-world applications and standards of wireless sensor networks.

Course Outcome:	After completion of the course, the student will be able to	Blooms Level
CO1	Understand concept of wireless communication and challenges in wireless sensor networks	K2
CO2	Interpret sensor node architecture, design issues and optimization goals	K3
CO3	Applying MAC and different routing protocol based on Wireless sensor network	K3
CO4	Discuss Infrastructure and security issues in wireless node sensor networks	K2
CO5	Design Wireless sensor network for different applications	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	-	1	-	-	-	-	-	-	3	1	2
CO2	2	3	2	-	2	-	-	-	-	-	-	2	3	2
CO3	2	3	3	2	2	-	-	-	-	-	-	3	2	3
CO4	2	2	1	2	2	-	-	-	-	-	-	2	2	2
CO5	2	2	3	2	3	-	1	-	1	-	-	3	3	3

Course Contents / Syllabus

Unit 1	Wireless Communication and WSN	10 hours
Wireless Communication: Fundamentals of wireless communication technology, the electromagnetic spectrum radio propagation, characteristics of wireless channels, Wireless Internet		
Introduction to wireless sensor networks: Key definitions of sensor networks, Characteristics, advantages and challenges of wireless sensor network		
Unit 2	Wireless Sensor Node Design	08 hours
Wireless Sensor node architecture: Wireless Single-Node Architecture Hardware Components, commercially available sensor nodes - IRIS, Mica Mote, EYES nodes, BT nodes, Energy Consumption of Sensor Nodes, Operating Systems, Network Architecture, Sensor Network Scenarios, Optimization Goals		
Unit 3	MAC and Routing Protocols	10 hours
MAC Protocols: IEEE 802.15.4 MAC protocol, MAC protocols for sensor network, location discovery, SMAC, BMAC, Traffic-adaptive medium access protocol (TRAMA), Issues in designing MAC protocols for wireless networks.		
Routing Protocols: classification of routing protocols, table-driven, on-demand, hybrid and flooding routing protocols, Issues in designing a routing protocol.		
Unit 4	Infrastructure and Security	09 hours

Infrastructure Establishment: Topology Control, Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control Platform		
Tool and Security: Programming Challenges, Node-level software platforms, Node-level Simulators. Security issues in Sensor Networks. Future Research Direction.		
Unit 5	Applications of WSN	08 hours
Applications of WSN: Home Control, Industrial Automation, Medical Applications, Reconfigurable Sensor Networks, Civil and Environmental Engineering Applications.		
Case Study: IEEE 802.15.4 LR-WPANs Standard, IEEE 802.11ax, Target detection and tracking, Field sampling.		
Total Lecture Hours		45 hours
Textbook: 1. Kazem Sohraby, Daniel Minoli and Taieb Znati, “Wireless Sensor Networks Technology, Protocols, and Applications “, John Wiley & Sons, 2007. 2. Holger Karl and Andreas Willig, “Protocols and Architectures for Wireless Sensor Networks,” John Wiley & Sons, Ltd, 2005. 3. Thomas L. Marzetta, Erik G. Larsson, Hong Yang, Hien Quoc Ngo, Fundamentals of Massive MIMO, Cambridge University Press		
Reference Books: 1. C. Siva Ram Murthy, and B. S. Manoj, "AdHoc Wireless networks ", Pearson Education – 2008. 2. William Stallings, "Wireless Communications and Networks ", Pearson Education - 2004.		
Self-Study Content Links:		Duration (in Hrs)
MOOCs (NPTEL)	Wireless Ad Hoc and Sensor Networks, IIT Kharagpur, Prof. Sudip Misra https://nptel.ac.in/courses/106105160	40 Hrs
Video Lectures	Introduction to Wireless Sensor Networks https://www.youtube.com/watch?v=BdMHIHFmlWY	2 Hrs
Web References	Research Papers on Wireless Sensor Networks https://arxiv.org/search/?query=wireless+sensor+network&searchtype=all&utm	50 Hrs

Note: Self-study material may include assignments, seminars, micro projects, industrial visits, any other student activities, etc.



Course Code: BCSE0614B						Course Name: Web Development using MERN STACK with Devops						L	T	P	C
Course Offered in: CSE/CSE(R)/IT/M.Tech Int. (CSE)												3	0	0	3
Pre-requisite: Basic knowledge of HTML, CSS, JavaScript, and fundamental programming concepts in any language.															
Course Objectives: This course aims to equip students with practical skills in building dynamic full-stack applications using React, Node.js, Express, and MongoDB. It also introduces DevOps principles, Agile methodologies, and CI/CD automation using tools like GitHub, Jenkins, Docker, and Kubernetes.															
Course Outcome: After completion of the course, the student will be able to												Bloom's Knowledge Level (KL)			
CO1	Apply the knowledge of ES6 that are vital to implement react application over the web.											K3			
CO2	Implement and Understand the impact of web designing by database connectivity with Mongoddb.											K3			
CO3	Explain, analyze and apply the role of server side scripting language like Nodejs and Express js framework.											K4			
CO4	Apply the benefits of DevOps over other software development processes to Gain insights into the DevOps environment.											K4			
CO5	Demonstrate popular open-source tools with features and associated terminology used to perform Continuous Integration and Continuous Delivery.											K3			
CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)															
CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	
CO1	3	2	3	1	3	1	1	-	1	-	2	2	2	3	
CO2	3	2	3	1	3	1	1	-	1	-	2	2	2	3	
CO3	3	2	3	1	3	1	1	2	1	2	2	2	2	2	
CO4	3	1	1	1	3	2	-	-	2	1	2	2	1	2	
CO5	3	1	1	1	3	1	-	-	2	1	2	2	1	3	
Course Contents / Syllabus															
Unit 1				Modern Frontend Development with React JS										9 hours	
Introduction: to React, Setting up React projects, React Folder Structure, JSX, Functional Components, and React Hooks (useState, useEffect, use Context), Props vs State, Stateless vs Stateful Components, Component Lifecycle, Routing with react-router-dom Introduction to Next.js for Server-Side Rendering and SEO, Integrating APIs with axios or fetch,.															
Unit 2				UI Libraries & MongoDB Integration										9 hours	
UI Libraries : Introduction to Google Material UI, Tailwind CSS, Theming and responsive design with MUI, Creating reusable UI components (Navbar, Toolbar, Dialogs), Introduction to MongoDB, CRUD Operations using Mongoose Indexes: Creating, Getting, Dropping, Aggregation Pipelines and Query Optimization, Data Modeling & Relationships, Auto-Sharding and Replication Concepts, Modern MongoDB tools: MongoDB Atlas, Compass.															
Unit 3				Backend with Node.js & Express										9 hours	
Node.js: Introduction to Node.js Setting up Express applications, Routing & Middleware, Restful API Design , JWT-based Authentication & Authorization ,Working with dotenv, CORS, body-parser. Express MVC Architecture in Express, File Upload Handling with Multer, Connecting Frontend with Backend via APIs, Introduction to GraphQL.															

Unit 4	DevOps Culture and Lifecycle	9 hours
Introduction to DevOps: Culture & Principles, DevOps Lifecycle and Agile vs DevOps, SDLC Models: Agile, Lean, Scrum, Kanban, Scrum: Process flow, Planning, Testing, Release Management, Introduction to Site Reliability Engineering (SRE), Overview of Terraform/Ansible, Configuration Management basics		
Unit 5	CI/CD, Docker & Kubernetes	9 hours
Git & GitHub: Introduction to Git, GitHub, Branching strategies, CI/CD Pipelines: Jenkins, GitHub Actions, Creating Jenkins Jobs and Pipelines, Integrating Git, Maven, and SonarQube, Introduction to Docker: Images, Containers, Lifecycle ,Building custom Docker Images, Docker Compose for multi-container apps, Container orchestration with Kubernetes, Creating Deployments, Services, and scaling with K8s, Basic monitoring tools: Prometheus and Grafana		
Total Lecture Hours		45 hours
Textbook:		
S.No	Book Title	Author
1.	Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node Paperback, 2 nd Edition (2017)	Vasan Subramanian
2.	Hands-On MERN Stack Web Development: Build production-grade web apps and APIs with MERN stack ,3 rd Edition (2019)	Shama Hoque
3.	Beginning MERN Stack: Build and Deploy a Full Stack MongoDB, Express, React, Node.js App 2 nd Edition (2021)	Greg Lim
Reference Books:		
S.No	Book Title	Author
1.	The DevOps Handbook: How to Create World-Class Agility, Reliability, & Security in Technology Organizations 2nd Edition (2003).	Gene Kim, Jez Humble, Patrick Debois, John Willis
2.	Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment Automation, 2nd Edition (2004).	Jez Humble, David Farley
3.	Test and Deploy Production-Grade Web Applications 1st Edition (2023).	Nabendu Biswas
Self Study Content Link:		
MOOCs	1. https://www.coursera.org/learn/fullstack-web-development 2. https://www.coursera.org/professional-certificates/ibm-full-stack-cloud-developer	4 Weeks 6 Months
Video Lectures	1. https://youtu.be/CvCiNeLnZ00 2. https://youtu.be/4nKWREmCvsE 3. https://youtu.be/f2EqECiTBL8 4. https://youtu.be/6GQRb4fGvtk 5. https://youtu.be/kTp5xUcalw	8 hrs 25 Min 7 hrs 8 Min 6 hrs
Web References	1. https://react.dev 2. https://docs.docker.com	



Approved by **AICTE**
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Government of India

101-150 Rank Band in Engineering
151-200 Rank Band in Overall

Accredited
'Grade A' 3.2*

CSE|IT|ECE|ME|BT
MBA|MCA

Prestigious 'Diamond'
Rating QS I-Gauge
NIET Greater Noida

Course Code: BCSAI0712	Course Name: Business Analytics	L	T	P	C
Course Offered in: CSE(DS)/CSE(IOT)/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		3	0	0	3

Pre-requisite: Basic knowledge of statistics, database systems, and spreadsheet tools such as Microsoft Excel.

Course Objectives:

- To provide knowledge of concepts and fundamentals of Business Analytics and Data Warehousing.
- To introduce data warehousing techniques and their applications in Business Analytics.
- To develop understanding of business data analysis using statistical methods.
- To familiarize students with different levels of business analytics using R Programming.
- To enable development of dashboards and reports for business decision-making.

Course Outcome: After completion of the course, the student will be able to

Blooms level

CO1 Understand concepts of Business Analytics and Data Warehousing	K2
CO2 Apply data ware housing techniques for Business Analytics.	K3
CO3 Analyze business data using statistical methods.	K4
CO4 Evaluate different level of business analytics using R Programming.	K5
CO5 Develop dashboards and reports	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	-	-	-	-	-	2	3	2	-
CO2	2	3	2	2	3	-	-	-	-	1	2	3	3	-
CO3	2	3	1	3	2	-	-	-	-	-	2	3	2	-
CO4	2	2	2	3	3	-	-	-	-	1	2	3	3	-
CO5	1	2	3	2	3	-	-	2	3	2	2	2	3	2

Course Contents / Syllabus

Unit 1	Introduction to Business Analytics	09 hours
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Business Analytics: Definition, Importance, Scope. Types of Analytics: Descriptive and Diagnostic. Business Analytics vs Business Intelligence. Role of Data in Decision Making. Applications and Analytics Lifecycle.

Unit 2	Data Warehousing	09 hours
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Data Warehouse Architecture: Fundamentals of Data Warehouse, Components of Data Warehouse, Three-Tier Architecture, Data Warehouse Models, Data Integration Techniques, Data Storage and Organization, **OLTP vs OLAP Systems:** ETL Process, Data Marts, Metadata, Star and Snowflake Schema, fact constellation schema.

Unit 3	Business Statistics	09 hours
Descriptive statistics: Definition and importance, Types, Measures of central tendency, dispersion, shape, Probability distributions: Basic concepts of probability, Random variables, Probability distribution functions, Expected value and variance, Applications in business decision-making, Sampling: Population vs Sample, Sampling techniques, Sampling distribution, Hypothesis testing: Concept of hypothesis, Types of errors, Statistical tests, Decision-making using hypothesis testing, Correlation, Regression, Time series basics.		
Unit 4	R Programming for Business Analytics	09 hours
Business Analytics Life Cycle, Model deployment, Steps in Problem Solving Process, Software used in Business Analytics, Getting Started with R. Data Manipulation & Statistics: Basics, Merging, Data Creation, Quantiles, Calculating Variance, Calculating Covariance, Cumulative Frequency, Library (mass), Head (faithful), Scatter Plot, Control Flow. Business Analytics using R: Normal PDF, Not Normal, SAT Example, Example- Birth Weights, dNorm, pNorm, qNorm, Understanding Estimation, Properties of Good Estimators, Central Limit Theorem, Kurtosis, Constructing Central Limit Theorem, Confidence Intervals for the Mean, Confidence Intervals Examples, t-distribution		
Unit 5	Dashboard Tools for Business Analytics: Zoho Analytics/Power Bi/ Tableau	09 hours
Getting started with Zoho Analytics - Terminologies & Workflows, Importing Data From Files, Feeds, and Cloud Storage, Data Modeling Building powerful Formulas Formatting Tables & Custom Sorting Lookups & Data Blending, Creating Reports Building Charts, Pivot Tables, Tabular Views, and Summary Tables Applying Filters Customizing Reports Chart picker guide, Creating Dashboards Creating a Dashboard Adding KPI Widgets Adding User Filters Customizing Dashboards Timeline Filter and Merging User Filters.		
Total Lecture Hours		45 hours
Text Books: 1. Business Statistics – S.C. Gupta & V.K. Kapoor 2. Fundamentals of Data Warehousing – Paulraj Ponniah 3. Business Analytics – James Evans		
Reference Books: 1. Data Warehousing in the Real World – Sam Anahory 2. Excel Data Analysis – Wayne Winston 3. Data Warehouse Toolkit – Ralph Kimball		
Self-Study Content Links:		Duration (in Hrs)
MOOCs	1. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013841821495222724874_shared/overview (8 hours 26 Min) 2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01384293374172364827469_shared/overview (6 Hours 57 minute)	15.38 hours
Video Lectures	1. https://youtu.be/BSJRH3njZEE?si=qIM99oq-5-rNLk51 (1.11 hours) 2. https://www.youtube.com/live/fGaJru-1fjI?si=CRUwLz8NEUSvPY3X (2hours 32 minutes) 3. https://youtu.be/vEM4YnRFGoA?si=tasXrN0jly_DkbQF (11 hours) 4. https://youtu.be/fDRa82lxzaU?si=C1cmExJuTkZRgNXf (1 hours) 5. https://www.youtube.com/live/ZR4e8fbVpp4?si=A8DOORxLKn7Qpzpg	15 hours 32 minutes

Web References	Reference Taken from: https://www.bmu.edu.in/social/delve-into-the-mba-in-business-analytics-syllabus-subjects/#Module_1 https://www.depaul.edu/academics/programs/business-analytics-ms?utm_content=772307929901&utm_term=business%20analytics%20universities%20usa&utm_medium=cpc&utm_source=google&utm_campaign=extm_international-nonbrand&gclid=aw.ds&gad_source=1&gad_campaignid=22975247660&gbraid=0AAAAADIwX73S3SFQuWnG_AxmtiVHO1Z8z&gclid=CjwKCAjwwJzPBhBREiwAJfHRnLC70RK4_t99A9YQ2ggDt8bLEiP3tvAFr7pTdVeDFjrHPRPd0ysNBoCIjMQAvD_BwE https://sunstone.in/blog/mba-in-business-analytics-syllabus https://www.onlinemanipal.com/blogs/mba-in-business-analytics-subjects-list https://www.eicta.iitk.ac.in/knowledge-hub/data-analytics/business-analytics-course-syllabus https://noida.amity.edu/blog/academics/mba-in-business-analytics-syllabus-scope-colleges-and-career-opportunities https://management.buffalo.edu/degree-programs/master-of-science-ms/business-analytics/campaigns/ub-msba-landing-page-google.html?utm_source=google&utm_medium=cpc&utm_campaign=FM-PPC-UB-SOM-MS-BusinessAnalytics-International-Program&gad_source=1&gad_campaignid=13724693728&gbraid=0AAAAADiSHE8chFADxOw5S7ybamtUqOhQ&gclid=CjwKCAjwwJzPBhBREiwAJfHRnXo9xdoI9IdhL1kZLNhxWW8F4rc3cWTbT2ApiuzLk02Ze7BT4Bws_BoChtAQAvD_BwE https://admission.isb.edu/admissions/amp/ampba/?utm_source=google&utm_medium=cpc&utm_campaign=AMPBA-B26_Google_Generic-Search_AI-Max_CPC_LP_GT&keyword=business%20analytics%20course&term={searchterm}&utm_source=google&utm_medium=cpc&campaignname=&adgroupname=Business_(Broad-Phrase)&keyword=business%20analytics%20course&term={searchterm}&creative=799773152771&devicemodel=&target=&device=c&network=g&matchtype=b&placement=&gclid=CjwKCAjwwJzPBhBREiwAJfHRnTC534j8TIwCVE55FA0ncZmj5yfvFg1htT4T2Nhw2UB7KCBOs0IQIRoCAE4QAvD_BwE&gad_source=1&gad_campaignid=23639572256&gbraid=0AAAABBTIpHKOhPhwiiAmtWB77e5nGEVei&gclid=CjwKCAjwwJzPBhBREiwAJfHRnTC534j8TIwCVE55FA0ncZmj5yfvFg1htT4T2Nhw2UB7KCBOs0IQIRoCAE4QAvD_BwE	10hours
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Ministry of Education
Government of India

101-150 Rank Band in Engineering
151-200 Rank Band in Overall

Accredited
'Grade A' 3-23

CSE|IT|ECE|ME|BT
MBA|MCA

Prestigious 'Diamond'
Rating QS I-Gauge
NIET Greater Noida

Course Code: BCSE0712					Course Name: RPA IMPLEMENTATION								L	T	P	C
Course Offered in: B. Tech. 4 th Year (7 th Semester) Computer Science													3	0	0	3
Pre-requisite: Basic understanding of Web Applications and Desktop Applications .																
Course Objectives:																
This course is designed to give a thorough understanding and practical skills in developing and deploying software robots for Robotic Process Automation (RPA).																
Course Outcome: After completion of the course, the student will be able to													Bloom’s Knowledge Level (KL)			
CO1	Apply basic concepts and methods from design engineering to explore creative solutions of real-world problems.												K3			
CO2	Learn Robotic Process Automation, and massive career opportunity in this field.												K2			
CO3	Implement the knowledge of RPA tools, functions in various industries and perform, control various tasks using RPA bots.												K3			
CO4	Gain expertise in Desktop, Web & Citrix Automation and use Reframework to build a structured business automation process.												K2			
CO5	Develop a real-world workflow automation project and will be able to debug a workflow.												K6			
CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)																
CO-PO MAPPING	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	3	3	2	1	2	–	–	–	–	–	–	2	3	2	2	
CO2	3	2	–	–	3	–	–	–	–	–	–	2	3	1	2	
CO3	3	3	3	2	3	–	–	–	–	–	–	2	3	3	2	
CO4	3	2	3	2	3	–	–	–	–	–	–	2	3	3	2	
CO5	3	3	3	2	3	–	–	–	1	1	–	3	3	3	3	
Course Contents / Syllabus																
UNIT 1	DATA MANIPULATION											9 HOURS				
Introduction to Data Manipulation, Scalar variables, collections and Tables, Text Manipulation, Data Manipulation, Gathering and Assembling Data Recording and Advanced UI Interaction; Recording Introduction, Basic and Desktop Recording, Web Recording, Input/output Methods, Screen Scraping, Data Scraping, Scraping advanced techniques.																

UNIT 2	SELECTORS	9 HOURS
Selectors, Defining and Assessing Selectors, Customization, Debugging, Dynamic Selectors, Partial Selectors, RPA Challenge, Image, Text & Advanced Citrix Automation, Introduction to Image & Text Automation, Image-based automation, Keyboard based automation, Information Retrieval, Advanced Citrix Automation challenges, Best Practices using tab for Images Starting Apps.		
UNIT 3	DATA TABLES AND AUTOMATION	9 HOURS
Excel Data Tables & PDF, Data Tables in RPA, Excel and Data Table Basics Data Manipulation in Excel, Extracting Data from PDF, extracting a single piece of data, Anchors, Using anchors in PDF. Email Automation: Email Automation, Incoming Email automation, Sending Email automation.		
UNIT 4	DEBUGGING AND EXCEPTION HANDLING	9 HOURS
Debugging Tools, Strategies for solving issues, Catching errors. Orchestrator: Tenants, Authentication, Users, Roles, Robots, Environments, Queues & Transactions, Schedules.		
UNIT 5	ROBOTIC FRAMEWORK	9 HOURS
Re-Framework template, Re-Framework template works, Use Re-Framework to automate your own processes. .NET Classes and Objects.		
Total Lecture Hours		45 HOURS
Textbook:		
Book Details		Authors Name
Crisper Learning: For UiPath, <i>Independently Published, Latest Edition, 2018</i>		Vaibhav Jain
Learning Robotic Process Automation, <i>Packt Publishing Ltd., Latest Edition, 2018</i>		Alok Mani Tripathi
Reference Books:		
Book Details		Authors Name
<i>The Simple Implementation Guide to Robotic Process Automation (RPA)</i> , iUniverse Press, Latest Edition		Kelly Wibbenmeyer
<i>It's Time to Automate</i> (eBook), UiPath, Latest Edition		UiPath
Self-Study Content Links:		Duration (in Hrs)
Video Lectures	https://www.youtube.com/playlist?list=PL41Y9S9wmyJarNN2KnB4XudpT1yE1kVd	1hrs+

	https://www.youtube.com/playlist?list=PL41Y9S9wmyLvF6Ou0oPhg6MrFWSw7sn4 https://www.youtube.com/playlist?list=PL41Y9S9wmylYX6kciM8DboVYymsv2y6K https://www.youtube.com/playlist?list=PL41Y-9S9wmyLeXL1DY9j-XepNb_vg9N8t https://www.youtube.com/playlist?list=PL41Y9S9wmyJi2zmWY77yPZrdVI7ab3Ja	1hrs+ 1hrs+ 1hrs+ 1hrs+
Web References	https://docs.uipath.com/studio/standalone/latest/user-guide/supported-applications-and-technologies?utm_source=chatgpt.com https://www.uipath.com/support?utm_source=chatgpt.com	

Course Code: BCSAI0711	Course Name: IoT for Smart Cities	L	T	P	C
Course Offered in: CSE(IOT)		3	0	0	3

Pre-requisite: IoT and Cloud computing

Course Objectives:

Students should understand Fundamentals of Smart cities and its urban planning structure and should be able to architect process of smart cities using IoT application. Student should be able to analyze changes in sustainable growth of smart cities.

Course Outcome: After completion of the course, the student will be able to
Blooms level

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:

**Bloom's
Knowledge
Level(KL)**

CO 1	Understand the structure, issues and challenges in designing smart cities	K2
CO2	Communicate and visualize IoT data with communication techniques and Hologram	K2
CO3	Implement the concept of automated doors and security systems for different IoT applications	K3
CO4	Analyze the concept of sustainable green energy and architect smart waste and water management like systems	K4
CO5	Implement smart city use cases with respect to Indian smart city plans	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	-	-	-	-	-	2	3	2	-
CO2	2	3	2	2	3	-	-	-	-	1	2	3	3	-
CO3	2	3	1	3	2	-	-	-	-	-	2	3	2	-

CO4	2	2	2	3	3	-	-	-	-	1	2	3	3	-
CO5	1	2	3	2	3	-	-	2	3	2	2	2	3	2

Course Contents / Syllabus

Unit 1	Introduction to Smart Cities	09 hours
Structures of city systems, Urban and Regional Planning, Informatics and Smart Cities, Smart Environment, Smart Streetlight, Smart Hospital Management System, Smart Automations, Smart Vehicles, Programming environment for IDE sensor and actuators used in the Development of smart city, Issues and Challenges in design of smart cities.		
Unit 2	Technology and Infrastructure used for Smart Cities	09 hours
Wireless sensor networks, Wi-Fi, ZigBee, 6lowpan Networks, Bluetooth, Ethernet Terahertz Communications, Intelligent personal edge computing, Hologram Technology, Inter-User Inter-Operator Knowledge Sharing, User- Centric Network Architecture, Full-Duplex Communication Stack.		
Unit 3	Security in Smart Cities	09 hours
Flexible and Intelligent Materials, Smart Meter Deployment, Automated door locks, Finger print Door Systems, Surveillance Cameras, RFID security systems, Library books anti-theft systems, Fog computing paradigms, Data Encryption Standard (DES) Techniques and its types, Blockchain for Decentralized Security.		
Unit 4	Understanding Sustainability and Urban Mobility	09 hours
Green 6G network, Green IoT, Visible light communication, WPT and Energy Harvesting, B2C (MAKER SCENE), Smart Agriculture, Reduction of CO ₂ , Smart Chemical Technology, Energy Consumption Monitoring, Smart Waste Management, Waste generation geo-specific data analysis, Smart bin sensors, Container Tracking, smart water management, Smart irrigation, Rain and storm water management.		
Unit 5	Smart Cities Case Studies	09 hours
International Case Studies of Dubai, Singapore with reference technologies (Communication technologies, Sensing technologies, Database technologies, architecture etc.) applications implementation and challenges India's Ecosystem for smart cities, Case Study on Smart City Projects in India: An analysis of Nagpur, Allahabad and Dehradun, Ideation of smart city implementation project.		
Total Lecture Hours		45 hours

Text Books:

S.No	Book Title	Author
1	Introduction To Smart Cities 1St Edition 2019	ANIL KUMAR, PEARSON
2	Smart Cities	Claude ROCHET, Wiley-ISTE 2018

Reference Books:

S.No	Book Title	Author
1	Smart City on Future Life - Scientific Planning and Construction	Xianyi Li 2012
2	Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia	Anthony Townsend 2013

LAB Course Code: BCSIOT0751					LAB Course Name: Wireless Sensors Network Lab							L	T	P	C
Course Offered in: CSE(IoT)												0	0	4	2
Pre-requisite: Computer Networks, IoT Protocols															
Course Objectives:															
1. To develop and simulate wireless network topologies and communication protocols using MATLAB simulation tools.															
2. To design and implement Wireless Sensor Network applications using Raspberry-Pi, sensors, and messaging protocols such as MQTT and AMQP.															
Course Outcome: After completion of the course, the student will be able to															
CO1	Create different topologies of Wireless Networks and implement protocols using MATLAB Simulation Tool.														K6
CO2	Design Wireless Sensor Network using Raspberry-Pi, sensors, and messaging protocols.														K6
CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)															
CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	
CO1	3	3	3	2	3	-	-	-	1	-	-	3	2	3	
CO2	2	3	3	2	3	-	-	-	2	1	-	2	3	3	
List Of Practical's (Indicative & Not Limited To)															CO
1. Create a sample wireless topology using MATLAB Simulation Tool.															CO1
2. Implement a Transmission Control Protocol and its variants using MATLAB Simulation Tool.															CO1
3. Implement a User Datagram Protocol using MATLAB Simulation Tool.															CO1
4. Implement a Power Efficient Gathering in Sensor Information System using MATLAB Simulation Tool.															CO1
5. Interface DHT Sensors with Node MCU and publish the sensing information on could using MQTT.															CO2
6. Communicate between two raspberry-pi nodes using MQTT protocol. Publish from one node and subscribe the data on second node.															CO2
7. Create WSN network with three raspberry-pi nodes and interface the sensors information among those. Use AMQP protocol for data exchange.															CO2
8. Five source nodes sensing temperature values are deployed in the ground floor of a building and these nodes send the values to a sink node deployed in the same floor of the building. A hierarchical network having 2 cluster nodes and three source nodes under each cluster is implemented in the first floor of a building for sensing light intensities. The sink nodes of both networks average the received values and send it to a gateway node located in the second floor. write a program for implementing this scenario.															CO2
9. To simulate and analyze the performance of the IEEE 802.15.4 MAC protocol in a Wireless Sensor Network using MATLAB.															CO1
10. To implement and simulate localization techniques for determining sensor node positions in a Wireless Sensor Network using MATLAB.															CO2