



**VIT**<sup>®</sup>

**Vellore Institute of Technology**

(Deemed to be University under section 3 of UGC Act, 1956)

**SCHOOL OF COMPUTER SCIENCE AND  
ENGINEERING**

**M. Tech CSE with Specialization  
in Business Analytics (Integrated)**

Curriculum

*(2019-2020 admitted students)*



## **VISION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY**

Transforming life through excellence in education and research.

## **MISSION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY**

**World class Education:** Excellence in education, grounded in ethics and critical thinking, for improvement of life.

**Cutting edge Research:** An innovation ecosystem to extend knowledge and solve critical problems.

**Impactful People:** Happy, accountable, caring and effective workforce and students.

**Rewarding Co-creations:** Active collaboration with national & international industries & universities for productivity and economic development.

**Service to Society:** Service to the region and world through knowledge and compassion.

## **VISION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**

To promote Knowledge centric education and accomplish innovative, state-of-the-art research in Computer Science and Engineering for the betterment of society.

## **MISSION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**

- Continuously endeavor to deliver knowledge centric education to students with the goal that they excel in novel computing technologies and acquire entrepreneurial skills with lifelong learning ethically and morally.
- To develop innovation and problem driven research that creates advanced Information and Communication Technologies (ICT) for transforming industry and society.
- Expedite the development of academia-industry collaborations and societal outreach programs.



## **M. Tech CSE with Specialization in Business Analytics - Integrated**

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

1. Graduate will acquire fundamental knowledge and expertise essential for professional practice in computer engineering.
2. Graduates will use suitable principle, hypothesis, mathematics and computational technology to analyze and solve problems encountered in the applications of computer systems.
3. Graduates will own a professional attitude as an individual or a team member with contemplation for society, professional ethics, environmental factors and motivation for lifelong learning.
4. Graduates will communicate, using oral, written and computer based communication technology, as well as function effectively as an individual and a team member in professional environment.
5. Graduates will realise the local, national and global issues related to the growth and applications of computer systems and to be solicitous of the impact of these issues on different cultures.



## **M. Tech CSE with Specialization in Business Analytics - Integrated**

### **PROGRAMME OUTCOMES (POs)**

PO\_01: Having an ability to apply mathematics and science in engineering applications.

PO\_02: Having a clear understanding of the subject related concepts and of contemporary issues and apply them to identify, formulate and analyze complex engineering problems.

PO\_03: Having an ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment

PO\_04: Having an ability to design and conduct experiments, as well as to analyze and interpret data, and synthesis of information

PO\_05: Having an ability to use techniques, skills, resources and modern engineering and IT tools necessary for engineering practice

PO\_06: Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems

PO\_07: Having adaptive thinking and adaptability in relation to environmental context and sustainable development

PO\_08: Having a clear understanding of professional and ethical responsibility

PO\_09: Having cross cultural competency exhibited by working as a member or in teams

PO\_10: Having a good working knowledge of communicating in English communication with engineering community and society

PO\_11: Having a good cognitive load management skills related to project management and finance

PO\_12: Having interest and recognize the need for independent and lifelong learning



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## **M. Tech CSE with Specialization in Business Analytics - Integrated**

### **ADDITIONAL PROGRAMME OUTCOMES (APOs)**

APO\_01: Having an ability to be socially intelligent with good SIQ (Social Intelligence Quotient) and EQ (Emotional Quotient)

APO\_02: Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified)

APO\_03: Having design thinking capability

APO\_04: Having computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning)

APO\_05: Having Virtual Collaborating ability

APO\_06: Having an ability to use the social media effectively for productive use

APO\_07: Having critical thinking and innovative skills

APO\_08: Having a good digital footprint



## **M. Tech CSE with Specialization in Business Analytics - Integrated**

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

On completion of M. Tech. CSE with Specialization in Business Analytics programme, graduates will be able to

PSO\_1: Graduates will be able to apply their mathematical, analytical, computational, managerial, operational and communication skills to process, model, analyze and visualize the data for uncovering the data-driven latent insights pertaining to any real world business application.

PSO\_2: Graduates will have judicious knowledge of data science and business analytics to apply appropriate strategies to solve industry's technological and managerial problems.



## **M. Tech CSE with Specialization in Business Analytics - Integrated**

### **CREDIT STRUCTURE**

#### **Category-wise Credit distribution**

<b>Category</b>	<b>Credits</b>
University Core (UC)	57
University Elective (UE)	12
Program Core (PC)	84
Program Elective (PE)	67
<b>Total</b>	<b>220</b>





## M. Tech CSE with Specialization in Business Analytics - Integrated

### DETAILED CURRICULUM

#### University Core

Course Code	Course Title	L	T	P	J	C	Remarks
CHY1002	Environmental Sciences	3	0	0	0	3	Non Credit Course
CSE1013	Problem Solving and Programming in C	0	0	6	0	3	
CSE1018	Problem Solving and Object Oriented Programming in JAVA	0	0	6	0	3	
	Technical Answers for Real World Problems (TARP)	1	0	0	4	2	
	Comprehensive Examination	0	0	0	0	1	
MAT5015	Mathematics for Engineers	3	1	0	0	4	
	Probability & Statistics for Engineers	3	0	2	0	4	
PHY1701	Engineering Physics	3	0	2	0	4	
ENG1901/	Technical English I	0/	0/	4/	0/		
ENG1902/	Technical English II	0/	0/	4/	0/	2	
ENG1903	Advanced Technical English	0	0	2	4		
ENG1000/	Foundation English I	0	0	4	0	2	Non Credit Course
ENG 2000	Foundation English II						
HUM1021	Ethics and Values	2	0	0	0	2	
	Accounting for Engineers	3	0	0	4	4	
	Capstone Project	0	0	0	0	16	
	Mini Project	0	0	0	0	4	
FLC4097	Foreign Language Courses Basket	2	0	0	0	2	
STS4097	Soft Skills	-	-	-	-	6	
Total Credits (A)						57	
Non Credit Course (B)						5	
University Core Courses (A-B)						57	



## M. Tech CSE with Specialization in Business Analytics - Integrated

### Programme Core

Course Code	Course Title	L	T	P	J	C
MAT3008	Linear Algebra & Transform Techniques	3	0	0	0	3
	Optimization Techniques	3	0	0	0	3
EEE1019	Foundations of Electrical and Electronics Engineering	3	0	2	0	4
CSE1021	Digital Logic and Computer Organization	3	0	0	0	3
SWE2001	Data Structures and Algorithms	3	0	2	0	4
SWE1004	Database Management Systems	3	0	2	0	4
	Software Engineering	3	0	2	0	4
SWE3001	Operating Systems	3	0	2	0	4
	Design and Analysis of Algorithms	3	0	0	0	3
	Programming for Data Science	0	0	6	0	3
	Theory of Computation & Compiler Design	3	0	0	0	3
	Computer Networks essentials	2	0	2	0	3
	Exploratory Data Analysis	3	0	0	4	4
	Introduction to Data Science & Business Analytics	3	0	0	0	3
	Machine Learning	2	0	2	4	4
	Big Data Frameworks	2	0	2	4	4
	Information Visualization	2	0	2	4	4
	Network security and cryptography fundamentals	2	0	0	4	3
	Deep learning	2	0	2	4	4
	Business analytics with spread sheet modelling	2	0	0	0	2
	Human Resource Management	3	0	0	0	3
	Operations research and Management	3	0	0	0	3
	Marketing Management	3	0	0	0	3
	Big data computing for Business Analytics	2	0	2	0	3
	Financial Management	3	0	0	0	3



## M. Tech CSE with Specialization in Business Analytics - Integrated

### Programme Elective

Course Code	Course Title	L	T	P	J	C
SWE2017	Parallel Programming	3	0	2	0	4
	Blockchain Technologies	3	0	0	0	3
	Cloud Application Development	2	0	2	4	4
	Cloud Ecosystem	3	0	2	0	4
	Internet of Things	2	0	2	4	4
SWE1010	Digital Image Processing	2	0	2	4	4
	Information Retrieval and Organization	2	0	0	4	3
SWE1017	Natural Language Processing	3	0	0	4	4
	DevOps	2	0	2	4	4
	Artificial Intelligence & Knowledge-Based Systems	3	0	0	4	4
	Speech Processing	3	0	0	4	4
	Bioinformatics	3	0	0	4	4
	Computer Vision	3	0	0	4	4
	Predictive Analytics with Case Studies	3	0	0	4	4
	Forensics analytics	3	0	0	4	4
	Big Data Ecosystem	2	0	2	4	4
	Data Privacy	3	0	0	0	3
	Healthcare Analytics	3	0	0	4	4
	Real-Time Analytics	3	0	0	4	4
	Image and Video Analytics	2	0	2	4	4
	Social Media Analytics	3	0	0	4	4
	Text & Web Mining	2	0	2	4	4
	Massive Data Mining	2	0	2	4	4
	NoSQL Databases	2	0	2	4	4



SWE1011	Soft Computing	3	0	0	4	4
	Recommender Systems	3	0	0	4	4
	Sequential and Spatial data mining	3	1	0	0	4
	Operations Analytics	3	0	0	4	4
	Lean Six Sigma Principles	3	0	0	4	4
	Econometrics	3	0	2	0	4
	Supply Chain Analytics	3	0	0	4	4
	Neuro Marketing	3	0	0	4	4
	Financial Analytics	2	0	2	4	4
	Customer Relationship Management	3	0	0	4	4
	Accounting Analytics	3	0	2	0	4
	Risk and Fraud Analytics	3	0	0	4	4
	Marketing Analytics	3	0	0	4	4
	Digital and Social Media Marketing	3	0	0	4	4
	Behavioural Analytics	2	0	2	4	4
	Retail Analytics	3	0	0	4	4
	Product Lifecycle Management	3	0	0	0	3
	Investment and Banking analytics	3	0	0	4	4
	HR Analytics	2	0	2	4	4



## M. Tech CSE with Specialization in Business Analytics - Integrated

### University Elective Baskets

#### Management courses

Sl.No	Code	Title	L	T	P	J	C
1	MGT1001	Basic Accounting	3	0	0	0	3
2	MGT1002	Principles of Management	2	0	0	4	3
3	MGT1003	Economics for Engineers	2	0	0	4	3
4	MGT1004	Resource Management	2	0	0	4	3
5	MGT1005	Design, Systems and Society	2	0	0	4	3
6	MGT1006	Environmental and Sustainability Assessment	2	0	0	4	3
7	MGT1007	Gender, Culture and Technology	2	0	0	4	3
8	MGT1008	Impact of Information Systems on Society	2	0	0	4	3
9	MGT1009	Technological Change and Entrepreneurship	2	0	0	4	3
10	MGT1010	Total Quality Management	2	2	0	0	3
11	MGT1014	Supply Chain Management	3	0	0	0	3
12	MGT1015	Business Mathematics	3	0	0	0	3
13	MGT1016	Intellectual Property Rights	3	0	0	0	3
14	MGT1017	Business Regulatory Framework For Start-ups	3	0	0	0	3
15	MGT1018	Consumer Behaviour	3	0	0	0	3
16	MGT1019	Services Marketing	3	0	0	0	3
17	MGT1020	Marketing Analytics	2	0	2	0	3
18	MGT1021	Digital and Social Media Marketing	3	0	0	0	3
19	MGT1022	Lean Start-up Management	1	0	0	4	2
20	MGT1023	Fundamentals of Human Resource Management	3	0	0	4	4
21	MGT1024	Organizational Behaviour	3	0	0	4	4
22	MGT1025	Foundations of Management And Organizational Behaviour	3	0	0	4	4



23	MGT1026	Information Assurance and Auditing	2	0	0	4	3
24	MGT1028	Accounting and Financial Management	2	2	0	4	4
25	MGT1029	Financial Management	2	1	0	4	4
26	MGT1030	Entrepreneurship Development	3	0	0	4	4
27	MGT1031	International Business	3	0	0	4	4
28	MGT1032	Managing Asian Business	3	0	0	4	4
29	MGT1033	Research Methods in Management	2	1	0	4	4
30	MGT1034	Project Management	3	0	0	4	4
31	MGT1035	Operations Management	3	0	0	0	3
32	MGT1036	Principles of Marketing	3	0	0	4	4
33	MGT1037	Financial Accounting and Analysis	2	1	0	4	4
34	MGT1038	Financial Econometrics	2	0	0	4	3
35	MGT1039	Financial Markets and Institutions	2	0	0	4	3
36	MGT1040	Personal Financial Planning	2	0	0	4	3
37	MGT1041	Financial Derivatives	2	1	0	4	4
38	MGT1042	Investment Analysis and Portfolio Management	2	0	0	4	3
39	MGT1043	Applications in Neuro Marketing	3	0	0	4	4
40	MGT1044	Global Brand Marketing Strategies	3	0	0	4	4
41	MGT1045	Industrial Marketing	3	0	0	4	4
42	MGT1046	Sales and Distribution Management	3	0	0	4	4
43	MGT1047	Social Marketing	3	0	0	4	4
44	MGT1048	Political Economy of Globalization	3	0	0	4	4
45	MGT1049	Sustainable Business Models	3	0	0	4	4
46	MGT1050	Software Engineering Management	2	0	0	4	3
47	MGT1051	Business Analytics for Engineers	2	2	0	0	3
48	MGT1052	Bottom of the Pyramid Operations	3	0	0	0	3
49	MGT1053	Entrepreneurship Development, Business Communication and IPR	1	0	2	0	2



50	MGT1054	Product Planning and Strategy	2	2	0	0	3
51	MGT1055	Design Management	2	2	0	0	3
52	MGT1056	Accounting and Financial Management	3	0	0	4	4
53	MGT6001	Organizational Behaviour	2	0	0	4	3

#### Humanities courses

Sl.No	Code	Title	L	T	P	J	C
1	HUM1001	Fundamentals of Cyber Laws	3	0	0	0	3
2	HUM1002	Business Laws	3	0	0	0	3
3	HUM1003	Basic Taxation for Engineers	3	0	0	0	3
4	HUM1004	Corporate Law for Engineers	3	0	0	0	3
5	HUM1005	Cost Accounting for Engineers	3	0	0	0	3
6	HUM1006	Business Accounting for Engineers	3	0	0	0	3
7	HUM1007	Contemporary Legal Framework for Business	3	0	0	0	3
8	HUM1009	International Business	3	0	0	0	3
9	HUM1010	Foreign Trade Environment	3	0	0	0	3
10	HUM1011	Export Business	3	0	0	0	3
11	HUM1012	Introduction to Sociology	3	0	0	0	3
12	HUM1013	Population Studies	3	0	0	0	3
13	HUM1021	Ethics and Values	2	0	0	0	2
14	HUM1022	Psychology in Everyday Life	2	0	0	4	2
15	HUM1023	Indian Heritage and Culture	2	0	0	4	2
16	HUM1024	India and Contemporary World	2	0	0	4	2
17	HUM1025	Indian Classical Music	1	0	2	4	1
18	HUM1033	Micro Economics	3	0	0	0	3
19	HUM1034	Macro Economics	3	0	0	0	3
20	HUM1035	Introductory Econometrics	2	0	2	0	2



21	HUM1036	Engineering Economics and Decision Analysis	2	0	0	4	2
22	HUM1037	Applied Game Theory	2	0	0	4	2
23	HUM1038	International Economics	3	0	0	0	3
24	HUM1039	Community Development in India	2	0	0	4	2
25	HUM1040	Indian Social Problems	3	0	0	0	3
26	HUM1041	Indian Society Structure and Change	3	0	0	0	3
27	HUM1042	Industrial Relations and Labour Welfare in India	3	0	0	0	3
28	HUM1043	Mass Media and Society	2	0	0	4	2
29	HUM1044	Network Society	3	0	0	0	3
30	HUM1045	Introduction to Psychology	2	0	2	0	2
31	HUM1706	Business Accounting for Engineers	3	0	0	0	3