MIT ART, DESIGN AND TECHNOLOGY UNIVERSITY, PUNE

# MIT SCHOOL OF ENGINEERING, PUNE

## STRUCTURE
## (First Year to Fourth Year)

**FOR**

# B. Tech. Information Technology

### Specialization in Data Analytics

**UNDER FACULTY OF TECHNOLOGY**

**2018 Regulation**

## Department of Information Technology

*Effective from July 2018*

**Publisher's Note**

**MIT Art, Design and Technology University (MITADT)**, Pune is established under the MIT Art, Design and Technology University Act, 2015 (Mah Act No. XXXIX of 2015). MIT ADT has a great pleasure in publishing the syllabus for **First Year Engineering** under the **Faculty of Engineering**.

On behalf of MIT ADT University, I thank all the experts of various departmental Board of Studies (BoS), who have contributed in designing of syllabus for all branches of Engineering. The syllabus content is designed to incorporate the industry requirement with great emphasis on project based and e-learning. Some of the content delivery and effective teaching methods suggested for student learning are flipped classroom, projects design, solving and implementing real time case studies through innovative practices to improve student learning.

I am thankful to Academic Council to approve the syllabus through debate and discussion on the suggestions giving by BoS. I am also grateful to Board of Management to give their necessary consent to the syllabus and its execution requirement. Finally, I appreciate all people involved in framing and approval of syllabus with their keen interest and whole-hearted co-operation in bringing out this publication.
I am confident that the approved syllabus is most appropriate to provide value based education along with career development skills like industry professionals, pursue higher education/research or to become an entrepreneur.

**Dr. Shivsharan Mali**
**Registrar,**
**MIT ADT University,**
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**B. Tech. (Information Technology)**
**Specialization in Data Analytics**
**(2018 Regulations)**

**(Minimum Credits to be earned: 164)**

## FIRST YEAR ENGINEERING SCHEME

### SEMESTER-I

| Sr. No. | Category/ Code | Subject | L | T | P | Credits | Marks |
|---|---|---|---|---|---|---|---|
| 1 | 18BTMT101 | Linear Algebra and Calculus | 3 | 1 | 0 | 4 | 100 |
| 2 | 18BTPY002 | Engineering Physics | 3 | 0 | 0 | 3 | 100 |
| 3 | 18BTEC005 | Basics of Electrical and Electronics Engineering | 3 | 0 | 0 | 3 | 100 |
| 4 | 18BTME011 | Engineering Graphics | 1 | 0 | 4 | 3 | 100 |
| 5 | 18BTEG104 | English Communication for Engineers | 2 | 0 | 0 | 2 | 50 |
| 6 | 18BTPY012 | Physics Laboratory | 0 | 0 | 2 | 1 | 100 |
| 7 | 18BTEC015 | Basics of Electrical and Electronics Engineering Lab | 0 | 0 | 2 | 1 | 100 |
| 8 | 18BTEG114 | English Communication Lab | 0 | 0 | 2 | 1 | 50 |
| | | **Total** | **12** | **1** | **10** | **18** | **700** |

### SEMESTER-II

| Sr. No. | Category | Subject | L | T | P | Credits | Marks |
|---|---|---|---|---|---|---|---|
| 1 | 18BTMT201 | Ordinary Differential Equations and Advanced Calculus | 3 | 1 | 0 | 4 | 100 |
| 2 | 18BTCH003 | Engineering Chemistry | 3 | 0 | 0 | 3 | 100 |
| 3 | 18BTCS006 | Programming for Problem Solving | 2 | 0 | 0 | 2 | 100 |
| 4 | 18BTIT202 | Digital Electronics and Microprocessors | 3 | 0 | 0 | 3 | 100 |
| 5 | 18BTCH013 | Chemistry Laboratory | 0 | 0 | 2 | 1 | 100 |
| 6 | 18BTCS016 | Programming Lab | 0 | 0 | 4 | 2 | 100 |
| 7 | 18BTMT017 | Engineering Workshop | 0 | 0 | 4 | 2 | 50 |
| 8 | 18BTIT212 | Digital Electronics and Microprocessors Lab | 0 | 0 | 2 | 1 | 100 |
| | | **Total** | **11** | **1** | **12** | **18** | **750** |

**CA = Continuous Assessment, FE= Final Examination,**
****Final Lab exam will be conducted with viva-voce of the respective practical (50 exam +10 viva = 60)**
**Coding for course/ subject: 18BTDA101,** Where; **18** = Year of BOS, **BT**=Bachelor in Technology**, DA** = Branch Code(DATA ANALYTICS), **1**= Semester No., **01 to N** = Sequence No of Subject. **For,** SE to BE& also PG follow the above scheme of regulation.

## SECOND YEAR ENGINEERING SCHEME

**SEMESTER-III**

| Course Code | Course Name | Hours/week | | | | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical | Credits | CA | FE | Total |
| 18BTDA301 | Data Structures | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA302 | Computer Organization & Architecture | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 18BTDA303 | Fundamentals of Communication Systems | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA304 | Economics for Engineers | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTMT305 | Discrete Mathematics | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA311 | Programming Laboratory | 0 | 0 | 4 | 2 | 40 | 60** | 100 |
| 18BTDA312 | Data Structures Laboratory | 0 | 0 | 4 | 2 | 40 | 60** | 100 |
| 18BTDA321 | Mini-Project-I | 0 | 0 | 2 | 1 | 100 | -- | 100 |
| Total | | 17 | 2 | 10 | 24 | 380 | 420 | 800 |

**SEMESTER-IV**

| **Course Code** | **Course Name** | **Hours/week** | | | | **Maximum Marks** | | |
|---|---|---|---|---|---|---|---|---|
| | | **Lecture** | **Tutorial** | **Practical** | **Credits** | **CA** | **FE** | **Total** |
| 18BTMT401 | Integral Calculus and Transform Techniques | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA402 | Operating Systems | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA403 | Computer Networks | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 18BTDA404 | Advanced Data Structures | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 18BTDA405 | Software Engineering and Project Management | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA411 | Operating Systems and Computer Network Laboratory | 0 | 0 | 4 | 2 | 40 | 60** | 100 |
| 18BTDA412 | Advanced Data Structures Laboratory | 0 | 0 | 4 | 2 | 40 | 60** | 100 |
| 18BTDA421 | Mini Project-II | 0 | 0 | 2 | 1 | 100 | -- | 100 |
| **Total** | | **17** | **1** | **10** | **23** | **380** | **420** | **800** |

**CA = Continuous Assessment, FE= Final Examination,** #Mini project using Object Oriented Programming,##Mini project using Data Base management concepts

****Final Lab exam will be conducted with viva-voce of the respective practical (50 exam +10 viva = 60)**

**Coding for course/ subject: 18BTDA101,** Where; **18** = Year of BOS, BT=Bachelor in Technology, **DA** = Branch Code(DATA ANALYTICS), **1**= Semester No.,

**01 to N** = Sequence No of Subject. **For,** SE to BE& also PG follow the above scheme of regulation.

## THIRD YEAR ENGINEERING SCHEME

**SEMESTER-V**

| Course Code | Course Name | Hours/week | | | | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical | Credits | CA | FE | Total |
| 18BTDA501 | Advanced Software Engineering | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 18BTDA502 | Theory of Computation | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA503 | Design and Analysis of Algorithms | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA504 | Database Management Systems | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 18BTDA505 | Statistical Analysis and Programming | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA511 | Design and Analysis of Algorithms Laboratory | 0 | 0 | 2 | 1 | 40 | 60** | 100 |
| 18BTDA512 | Statistical Analysis and Programming Laboratory | 0 | 0 | 4 | 2 | 40 | 60** | 100 |
| 18BTDA521 | Mini Project –III | 0 | 0 | 2 | 1 | 100 | -- | 100 |
| **Total** | | **16** | **2** | **8** | **22** | **380** | **420** | **800** |

**SEMESTER-VI**

| Course Code | Course Name | Hours/week | | | | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical | Credits | CA | FE | Total |
| 18BTDA601 | Data Analytics | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA602 | Software Modeling and Design | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 18BTDA603 | Web Technology | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA604 | Artificial Intelligence | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA6__ | Elective I (Professional) | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA611 | Data Analytics Lab | 0 | 0 | 2 | 1 | 40 | 60** | 100 |
| 18BTDA612 | Advanced Programming Lab(WT,AI, Elective I) | 0 | 0 | 4 | 2 | 40 | 60** | 100 |
| 18BTDA621 | Mini Project-IV | 0 | 0 | 2 | 1 | 100 | -- | 100 |
| **Total** | | **18** | **1** | **8** | **23** | **380** | **420** | **800** |

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****Final Lab exam will be conducted with viva-voce of the respective practical (50 exam +10 viva = 60)**
**Coding for course/ subject: 18BTDA101,** Where; **18** = Year of BOS, **BT**=Bachelor in Technology, **DA** = Branch Code(DATA ANALYTICS), **1**= Semester No.,
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## FINAL YEAR ENGINEERING SCHEME

**SEMESTER-VII**

| Course Code | Course Name | Hours/week | | | | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical | Credits | CA | FE | Total |
| 18BTDA701 | Distributed Systems | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTIDA702 | Data Mining and Data Warehousing | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 18BTDA7__ | Elective-II (Professional) | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA7__ | Elective-III (Professional) | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA7__ | Open Elective-I** | 4 | 0 | 0 | 4 | 40 | 60 | 100 |
| 18BTDA711 | Distributed Systems Laboratory | 0 | 0 | 4 | 2 | 40 | 60** | 100 |
| 18BTDA712 | Data Mining DW Laboratory | 0 | 0 | 2 | 1 | 40 | 60** | 100 |
| 18BTDA721 | Project Phase-I | 0 | 0 | 4 | 2 | 100 | -- | 100 |
| **Total** | | **19** | **0** | **10** | **24** | **380** | **420** | **800** |

**SEMESTER-VIII**

| Course Code | Course Name | Hours/week | | | | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical | Credits | CA | FE | Total |
| 18BTDA821 | Project Phase-II | 0 | 0 | 24 | 12 | 40 | 60 | 100 |
| **Total** | | **0** | **0** | **24** | **12** | **180** | **320** | **500** |

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****Final Lab exam will be conducted with viva-voce of the respective practical (50 exam +10 viva = 60)**
**Coding for course/ subject: 18BTDA101,** Where; **18** = Year of BOS, **BT**=Bachelor in Technology, **DA** = Branch Code(DATA ANALYTICS), **1**= Semester No.,
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## List of Electives (Professional)

| Elective | Course Name | |
|---|---|---|
| Elective-I | 18BTDA631 | Computer Vision |
| | 18BTDA632 | Pattern Recognition Techniques |
| | 18BTDA633 | Soft Computing |
| | 18BTDA634 | Multivariate Techniques in Data Analytics |
| Elective-II | 18BTDA731 | Information Storage & Management |
| | 18BTDA732 | Mobile Computing |
| | 18BTDA733 | Natural Language Processing |
| | 18BTDA734 | Business Intelligence |
| Elective-III | 18BTDA735 | Big Data Analytics |
| | 18BTDA736 | Machine Learning |
| | 18BTDA737 | Image Processing |
| | 18BTDA738 | Wireless Sensor Networks |
| Open Elective-I | 18BTDA739 | Internet of Things |
| | 18BTDA740 | Cloud Computing |
| | 18BTDA741 | Operations Research |
| | 18BTDA742 | Bio Informatics |