



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)



Structure
for
B. Tech. Information
Technology

w.e.f. Academic Year
2019-2020

(2019 Pattern)



Department of Information Technology

Vision

“To create quality information technology professionals through superior academic environment.”

Mission

- To incorporate the IT fundamentals in students to be successful in their career.
- To motivate students for higher studies, research and entrepreneurship.
- To provide IT services to society.



Dr. Ram Joshi
BoS Chairman & Dean Academics



Dr. Rakesh K. Jain
Director



Department of Information Technology

Program Outcomes (POs)

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. JSPM's Rajarshi Shahu College of Engineering Department of IT Engineering
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

Upon successful completion of UG course in Information Technology, the students will attain following PSOs:

1. Utilize discrete principles of mathematics along with programming paradigms to expedite solution building in the IT domain.
2. Apply computational techniques using core aspects of network and system programming to deliver secured application in the arena of analytics and computing.
3. Develop team spirit with project management skills to handle multidisciplinary complex tasks proficiently and utilize these skills for entrepreneurship

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Highlights of the Syllabus

Curriculum of Information Technology Department is designed in consultation with experts like:



Academic Experts



Industry/Corporate Experts



Distinguished Alumni

Following are the features of the curriculum of the **Information Technology Department** designed in association with the **Persistent Systems Pvt. Ltd. Pune** and **Tata Consultancy Services, Pune**



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Unique features of the curriculum

1. Curriculum centered at Outcome Based Education:

The new Curriculum is based on student-centered instruction models that focus on measuring student performance through outcomes. The outcomes include subject knowledge, industry required skills and attitudes.

2. Emphasize on Fundamentals:

The nature of the new curriculum is rigorous and well prescribed so that the students can spend more time on preparation and self-study. The students have to learn core subjects, solve practical based assignments and must attempt periodical quizzes. This will benefit them to grasp and keep a strong hold on fundamentals of Engineering in the most effective way.

3. Experiential Learning:

The curriculum emphasizes on hands-on sessions along with theoretical information. The new curriculum considers Problem Based Learning (PBL) as a teaching pedagogy and includes different subjects that encourage the students for hands on learning through virtual labs, mini-projects, etc. Accordingly, the curriculum maintains good balance between theory and laboratory credits.

4. Promote Creativity and Innovation:

Along with experiential learning, the curriculum also motivates the students to inculcate creativity and innovation. Apart from conventional lab, the curriculum provides a freedom for students to perform industry assignments, pilot projects, innovative development, etc.

5. Inculcating Ethics and Values:

To improvise student's behavior, the curriculum has included systematic courses on ethics and values. The moral principles can help students to make right decisions, lead their professional lives and become ethical citizen.

6. Blend of Curricular and Noncurricular Activities

The curriculum also gives importance of different activities like co-curricular, extra-curricular, sports, culture, etc. This will help to do all round development of students in all possible ways.

7. Four Tracks in B-Tech:

The curriculum provides four tracks in the curriculum as

- | | |
|----------------------------------|----------------------|
| I. Industry Internship | II. Entrepreneur |
| III. Higher Studies and Research | IV. In house Project |

8. Global Competence:

The curriculum provides a unique opportunity for students to learn and engage in open and effective interaction with people from diverse and interconnected world. The combination of foreign languages (German, Japanese, English) and international internships in the curriculum help the students to build a capacity to examine global and intercultural issues and to propose perspectives and views.

9. Industry Induced Internship Program

To support ever demanding industry requirements, the curriculum has included an industry internship with an objective to learn technologies pertaining to their discipline and enhance their technical knowledge with a support of the live platform of Industry.

10. Motivation for Self Learning:

The curriculum also offers a freedom to students to take the initiatives in their learning needs and set the goals with the help of online learning platforms like MOOCs, NPTEL, Swayam, etc.



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Structure for Group 2

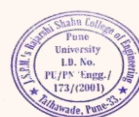
F. Y. B. Tech.

Academic Year – 2020-2021 Semester -I

Course Code	Course	Teaching Scheme			Examination Schemes						Credits
		TH	Tut	Lab	Theory			Practical		Total	Total
					ISE (15)	MSE (25)	ESE (60)	TW	Lab		
ES1106	Introduction to Probability, Statistics and Calculus	3	1	-	15	25	60	25	-	125	4
ES1107	Fundamentals of Physics	3	-	2	15	25	60	-	25	125	4
ES1108	Discrete Mathematics	3	1	-	15	25	60	25	-	125	4
EE 1102	Principles of Electrical Engineering	3	-	2	15	25	60	-	25	125	4
CS1103	Fundamentals of Computer Programming	3	-	4	15	25	60	-	50	150	5
HS1104	Business Communication and Value Science -I	-	-	2	-	-	-	-	25	25	1
ES 1104	Engineering Design and Development OR										
HS1101/ HS1102/ HS1103/ HS1104	Language Proficiency-I: # English / German / Japanese / French	-	-	2	-	-	-	-	25	25	1
HS1108	Induction Training\$	Non Credit									
Total		15	2	12	75	125	300	50	150	700	23

Dr. S M Yadav
H.O.D, Engg. Science

Dr. S V Kedar
Dean Academics



Dr. R. K. Jain
Director RSCOE, Pune



Structure for Group 2

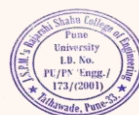
F. Y. B. Tech.

Academic Year – 2020-2021 Semester -II

Course Code	Course	Teaching Scheme			Examination Schemes						Credits
		TH	Tut	Lab	Theory			Practical		Total	Total
					ISE (15)	MSE (25)	ESE (60)	TW	Lab		
ES1109	Linear Algebra	3	1	-	15	25	60	25	-	125	4
ES1110	Statistical Methods	3	1	-	15	25	60	25	-	125	4
CS1104	Data Structure and Algorithms	3	-	4	15	25	60	-	50	150	5
EC1102	Principles of Electronics Engineering	3	-	2	15	25	60	-	25	125	4
HS1106	Principles of Economics	3	-	-	15	25	60	-	-	100	3
HS1105	Business Communication and Value Science -II	-	-	2	-	-	-	-	25	25	1
CE1103	Environmental Studies	-	-	2	-	-	-	-	25	25	1
ES 1104	Engineering Design and Development										
	OR										
HS1101/ HS1102/ HS1103/ HS1104	Language Proficiency-I: # English / German / Japanese / French	-	-	2	-	-	-	-	25	25	1
Total		15	2	12	75	125	300	50	150	700	23

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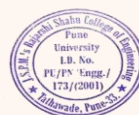


Instructions:

1. # Every student should appear for language Proficiency-I and Engineering Design Development (EDD) during the year.
2. \$ For the Induction Training, the branch wise allocation in a group of 20-22 students is to be formed with one faculty as mentor for each group.
3. ISE, MSE and ESE indicates Internal Semester Evaluation, Mid Semester Evaluation and End Semester Evaluation respectively.

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A.Y. 2021-2022

S. Y. B. Tech. (Department of Information Technology)

Semester-III- Syllabus Structure

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks						Credits
		TH	TU	Lab	ISE (15)	MSE (25)	TH	TW	Lab	Total	
IT2101/	Fundamentals of Data Communication/	3	1	0	15	25	60	25	-	125	4
IT2121	Software Engineering										
IT2102/	Database Management System/	3	0	4	15	25	60	-	50	150	5
IT2122	Object Oriented Programming										
IT2103/	Computer System and Organization/	3	0	0	15	25	60	-	-	100	3
IT2123	Computer Organization & Architecture										
IT2104/	Programming Paradigms/	3	0	2	15	25	60	-	25	125	4
IT2124	Computational Statistics										
IT2105/	Computer Graphics/	3	0	2	15	25	60	-	25	125	4
IT2125	Computer Graphics and Animation										
HS2104	Human Values and Ethics	0	0	2	-	-	-	-	25	25	1
IT2106	Python Programming	0	0	2	-	-	-	-	25	25	1
IT2107	#Engineering Design and Innovation I										
OR											
HS2101	#Language Proficiency II:	0	0	2	-	-	-	-	25	25	1
HS2102	English/										
HS2103	German/										
HS2109	Japanese/										
	French										
\$\$	Audit Course- I	Non Credit Course									
Total		15	1	14	75	125	300	25	175	700	23

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Audit Course 1 Options

\$\$	Audit Course I Title
EC2107	Intellectual Property Rights and Patents
CE2106B	Road Safety Management
HS2106	Indian Constitution
IT2108	Online Certification Course



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S. Y. B. Tech. (Department of Information Technology) Semester-IV- Syllabus Structure

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks						Credits
		TH	TU	Lab	ISE (15)	MSE (25)	TH	TW	Lab	Total	
ES2104	Engineering Mathematics-III /	4	1	0	15	25	60	25	-	125	5
ES2103	Calculus and Transform										
IT2109	Formal Language and Automata Theory /	3	0	0	15	25	60	-	-	100	3
IT2126	Formal Language and Automata Theory										
IT2110	Advanced Database Management System /	3	0	4	15	25	60	-	50	150	5
IT2127	Database Management System										
IT2111	Computer Networks and Applications /	3	0	2	15	25	60	-	25	125	4
IT2128	Computer Networks										
IT2112	Software Engineering and Agile development/	3	0	0	15	25	60	-	-	100	3
IT2129	Operation Research										
IT2113/	Web Technology /	0	0	2	-	-	-	-	50	50	1
HS2105	Business Communication and Value Science –III										
IT2114	Skill Development /	0	0	2	-	-	-	25	-	25	1
IT2130	Project Ideation and Intellectual Property Right										
IT2107	#Engineering Design and Innovation-I	0	0	2	-	-	-	-	25	25	1
	OR										
HS2101	#Language Proficiency II: English/										
HS2102	German/										
HS2103	Japanese/										
HS2109	French										
\$\$	Audit Course- II	Non Credit Course									
Total		16	01	12	75	125	300	25	175	700	23

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Audit Course 2 Options

\$\$	Audit Course II Title
CE2113B	Environmental awareness
HS2108	Indian Traditional Knowledge
ME2111C	Innovation in Agricultural Engineering
IT2115	Online Certification Course



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T. Y. B. Tech. (Department of Information Technology)

Semester-V- Syllabus Structure

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks							Credits
		TH	TU	Lab	ISE (15)	MSE (25)	TH (60)	TW	OR	PR	Total	
IT3101 / IT3115	Operating System Operating System and Design	3	-	4	15	25	60	25	-	25	150	5
IT3102 / IT3116	Computational Complexity and Algorithm Design and Analysis of Algorithm	3	-	2	15	25	60	25	-	25	150	4
IT3103 / IT3117	Cloud Computing Image Processing and Pattern Recognition	3	-	-	15	25	60	-	-	-	100	3
IT3104 / HS3102	Computational Statistics Fundamentals of Management and Strategy Formulation	3	-	-	15	25	60	-	-	-	100	3
IT3105	Elective-I	3	-	-	15	25	60	-	-	-	100	3
IT3106	Advanced Python Programming	-	-	4	-	-	-	-	-	50	50	2
IT3107	Design Thinking	-	2	-	-	-	-	50	-	-	50	2
\$\$	Audit Course-III	Non-Credit Course										
Total		15	2	10	75	125	300	100	-	100	700	22


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Elective I Options

Elective I Course Code	Elective I Title
IT3105A	User Interface and User Experience Design
IT3105B	Business Analytics and Intelligence
IT3105C	Internet of Things
IT3105D	Modern Web Applications

Audit Course 3 Options

\$\$	Audit Course III Title
HS3106	Essence of Indian Knowledge Tradition -I
HS3108	Cultural Studies
CE 3113	Urbanization and Environment



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T. Y. B. Tech. (Department of Information Technology)
Semester-VI- Syllabus Structure

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks							Credits
		TH	TU	Lab	ISE (15)	MSE (25)	TH (60)	TW	PR	OR	Total	
IT3108 / IT3118	Artificial Intelligence											
	Artificial Intelligence & Robotics	3	-	2	15	25	60	-	25	-	125	4
IT3109 / IT3119	Cyber Security											
	Information and Cyber Security	3	-	-	15	25	60	-	-	-	100	3
IT3110 / IT3120	Advance Software Modeling											
	Cloud Microservices and applications	3	-	2	15	25	60	-	-	25	125	4
IT3111 / IT3121	Machine Learning											
	Machine Learning and Applications	3	-	2	15	25	60	-	50	-	150	4
IT3112	Elective-II	3	-	-	15	25	60	-	-	-	100	3
IT3113	Engineering Design and Innovation-II	-	-	2	-	-	-	-	-	50	50	1
IT3114	Business Communication	-	-	2	-	-	-	-	50	-	50	1
\$\$	Audit Course-IV				Non-Credit Course							
Total		15	0	10	75	125	300	-	125	75	700	20


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Elective II Options

Elective II Course Code	Elective II Title
IT3112A	High Performance Computing
IT3112B	Ethical Hacking
IT3112C	Mobile Computing
HS3103C	Financial and Cost Accounting

Audit Course 3 Options

\$\$	Audit Course IV Title
HS3107	Essence of Indian Knowledge Tradition –II
HS3109	Introduction to Human Factors and Ergonomics
HS3110	Mind Education



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Final Year B. Tech. (Department of Information Technology)
Semester-VII- Syllabus Structure

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks						Credits
		TH	TU	Lab	ISE (15)	MSE (25)	ESE (60)	TW	LAB	Total	
IT4101	Parallel and Distributed Computing	03	-	02	15	25	60	-	50	150	4
IT4102	Deep Learning	03	-	02	15	25	60	-	50	150	4
IT4103	Elective-III	03	-	02	15	25	60	-	50	150	4
IT4104	Project Phase I	-	-	12	-	-	-	50	100	150	6
Total		09	-	18	45	75	180	50	250	600	18

Elective III Options

Elective III Course Code	Elective III Title
IT4103A	Wireless Sensor Network
IT4103B	Blockchain Technology
IT4103C	Software Testing and Quality Assurance
IT4103D	Software Defined Network


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Final Year B. Tech. (Department of Information Technology)
Semester-VIII- Syllabus Structure
Track I –Regular

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks						Credits
		TH	TU	Lab	ISE (15)	MSE (25)	ESE (60)	TW	LAB	Total	
IT4105	Soft Computing	03	-	-	15	25	60	-	-	100	03
IT4106	Finance and Management Information System	03	-	-	15	25	60	-	-	100	03
IT4107	Industry-Sponsored Subject- Data Management, Protection, and Governance	03	-	-	15	25	60	-	-	100	03
IT4108	IT Lab-Track-I	-	-	02	-	-	-	-	50	50	01
IT4109	Project Phase II	-	-	16	-	-	-	150	100	250	08
Total		09	-	18	45	75	180	150	150	600	18


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Final Year B. Tech. (Department of Information Technology)
Semester-VIII- Syllabus Structure
Track II - Industry Internship and Project

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks						Credits
		TH	TU	Lab	ISE (15)	MSE (25)	ESE	TW	LAB	Total	
IT4110	Industry Internship	-	-	20	-	-	-	150	200	350	10
IT4109	Project Phase II	-	-	16	-	-	-	150	100	250	08
Total		-	-	36	-	-	-	300	300	600	18

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Final Year B. Tech. (Department of Information Technology)
Semester-VIII- Syllabus Structure

Track III – Entrepreneurship

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks						Credits
		TH	TU	Lab	ISE (15)	MSE (25)	ESE (60)	TW	LAB	Total	
IT4111	Business Modeling	03	-	-	15	25	60	-	-	100	03
IT4106	Finance and Management Information System	03	-	-	15	25	60	-	-	100	03
IT4107	Industry-Sponsored Subject- Data Management, Protection, and Governance	03	-	-	15	25	60	-	-	100	03
IT4112	IT Lab-Track-III	-	-	02	-	-	-	-	50	50	01
IT4109	Project Phase II	-	-	16	-	-	-	150	100	250	08
Total		09	-	18	45	75	180	150	150	600	18


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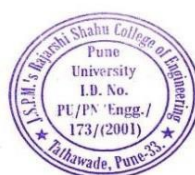
Final Year B. Tech. (Department of Information Technology)
Semester-VIII- Syllabus Structure

Track IV – Higher Studies and Research

Course Code	Course	Teaching Scheme			Semester Examination Scheme of Marks						Credits
		TH	TU	Lab	ISE (15)	MSE (25)	ESE (60)	TW	LAB	Total	
IT4113	Research Methodology	03	-	-	15	25	60	-	-	100	03
IT4106	Finance and Management Information System	03	-	-	15	25	60	-	-	100	03
IT4107	Industry-Sponsored Subject- Data Management, Protection, and Governance	03	-	-	15	25	60	-	-	100	03
IT4114	IT Lab-Track IV	-	-	02	-	-	-	-	50	50	01
IT4109	Project Phase II	-	-	16	-	-	-	150	100	250	08
Total		09	-	18	45	75	180	150	150	600	18


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 BoS Chairman

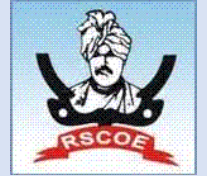

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Structure and Syllabus
for
B. Tech. Information Technology
with Honors in
**“Machine Learning for
Cyber Security”**

w. e. f. Academic Year 2021-2022
(2019 Pattern)

Dr. Ram Joshi BoS
Chairman & Dean of
Academics

Dr. Rakesh K. Jain
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B. Tech. Information Technology
(Honors Course)
Machine Learning for Cyber Security

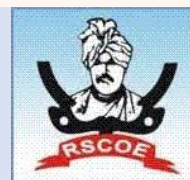
Course Code	Course	Teaching Scheme			Examination Schemes						Credits
		TH	Tut	Lab	Theory			Practical		Total	Total
					ISE (15)	MSE (25)	ESE (60)	TW	Lab		
T. Y. Sem V											
ITH3101	Foundations of Cyber Security	04	-	-	15	25	60	-	-	100	04
T. Y. Sem VI											
ITH3102	Machine Learning and Cyber Security	03	-	02	15	25	60	-	25	125	04
ITH3103	Machine Learning for Penetration Testing	03	-	02	15	25	60	-	25	125	04
B. Tech. Sem VII or Sem VIII											
ITH4101	Usable Security	04	-	-	15	25	60	-	-	100	04
ITH4102	Software Security	04	-	-	15	25	60	-	-	100	04
Total		18	-	04	75	125	300	-	50	550	20

Dr. Ram Joshi BoS
 Chairman & Dean of
 Academics

Dr. Rakesh K. Jain
 Director



JSPM's
RAJARSHI SHAHU COLLEGE OF ENGINEERING
TATHAWADE, PUNE-33
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Computer Engineering (Honor Course)
Data Science
Structure

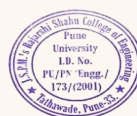
Course Code	Course	Teaching Scheme			Examination Schemes					Credits	
		TH	Tut	Lab	Theory			Practical		Total	Total
					ISE (15)	MSE (25)	ESE (60)	TW	Lab		
T. Y. Sem V											
CSH3101	Data Analytics	4		-	15	25	60	-	-	100	4
T. Y. Sem VI											
CSH3102	Data Science and Visualization	3	-	2	15	25	60	25	25	150	4
CSH3103	Conversational Systems for Business	3	-	2	15	25	60	25	25	150	4
B.Tech. Sem VII/VIII											
CSH4101	Advanced Social, Text and Media Analytics	4	-	-	15	25	60	-	-	100	4
CSH4102	Cognitive Science & Business Analytics	4	-	-	15	25	60	-	-	100	4
Total		18	-	4	75	125	300	50	50	600	20

Seemaal

Dr. S V Kedar
H.O.D, Computer

R.B. Joshi

Dr. R B. Joshi
Dean Academics



R.K. Jain

Dr. R. K. Jain
Director RSCOE, Pune



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Structure and Syllabus
for
B. Tech. Information Technology
with
Minors in “Computer Systems”

w. e. f. Academic Year 2021-2022
(2019 Pattern)



B. Tech. Information Technology
(Minors Course)
Computer Systems

Course Code	Course	Teaching Scheme			Examination Schemes						Credits
		TH	Tut	Lab	Theory			Practical		Total	Total
					ISE (15)	MSE (25)	ESE (60)	TW	Lab		
T. Y. Sem V											
ITM3101	Problem solving through Programming in C	04	-	-	15	25	60	-	-	100	04
T. Y. Sem VI											
ITM3102	Data Structure using C++	03	-	02	15	25	60	-	25	125	04
ITM3103	Database Management System	03	-	02	15	25	60	-	25	125	04
B. Tech. Sem VII or Sem VIII											
ITM4101	Computer Network and Security	04	-	-	15	25	60	-	-	100	04
ITM4102	Internet Technology	04	-	-	15	25	60	-	-	100	04
Total		18	-	04	75	125	300	-	50	550	20

Dr. Ram Joshi BoS
 Chairman & Dean of
 Academics

Dr. Rakesh K. Jain
 Director