

Curriculum Revision



ABV-Indian Institute of Information
Technology & Management, Gwalior

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Preamble

An educational institute of higher learning needs to review and take a pragmatic view about the curriculum it imparts to students. The following observations may be noted:

- There is large variation in abilities (knowledge and skills) amongst the students admitted in a programme and desired level of preparedness of students admitted to a specific programme
- There is a need to impart training in Communication skills / Research Methodology / Professional Practices course
- Need for adopting a different pedagogy in addition to the traditional one.
- Many times, we experience lack of clarity regarding desirable orientation (e.g. research or employment versus research focus improving employability)
- There is also a need for flexibility in the credit structure of the programme

The following tenets are to be kept in mind:

- a) Major objective is to prepare the student for a work environment requiring continued growth and prepare students to apply technology to real world applications and problems.*
- b) The Academic must prepare individuals for careers in industry, R&D organizations/academic institutions or advanced technical / Managerial positions in industry and government.*
- c) Philosophy of synergizing Information Technology and Management and offering career oriented courses that prepare students for work on the cutting edge of technology / management and prepare them to learn the everyday technical changes as they enter into the working environment*
- d) The program should equip students with an in-depth understanding of core and advanced topics in Information Technology / Computer Science Engineering / Management and teaches students how to use the latest tools to solve real world problems.*
- e) The program must blend theory and practice into a learning experience that develops skills applicable to complex real-world problems.*

In this context, an extensive curriculum exercise was undertaken. Various committees formed for this purpose are given in Appendix F.

APPENDIX A: New Proposed Course Structure: B.Tech (CSE)

Proposed Curriculum

Name of the Programme: B.Tech(Computer Science & Engineering)

The Bachelor of Technology Course in Computer Science & Engineering provides students with a broad foundation and in-depth understanding of computer science with necessary problem solving and innovation skills needed to succeed in engineering. The core courses include a comprehensive study of data structures, programming languages, algorithms and computer networks. In addition to these courses, students are also provided courses in applied mathematics, physics, humanities and management for the overall skill enhancement. The elective courses are also introduced in open elective clusters: Artificial Intelligence and Machine Learning, Information Security, Networks, VLSI, Visual information processing, Theoretical and analytical Computer Science. A student can opt electives depending upon the interest from either of the clusters to fulfill the semester credits. The program is designed to develop student's skills with extensive knowledge and hands-on experience to analyze, design and implement cutting-edge computer technologies. For developing advanced and specialized skills, courses in Big Data, Cloud Computing, Internet of Things, Cyber Security, Machine Learning and Artificial Intelligence are introduced that also enable students to explore the wider applications and latest trends of computer science.

Expected competencies from students

Upon completion of the academic requirements, graduate students of Computer Science will be able to demonstrate:

1. An understanding of professional and ethical responsibility and to function effectively in terms to accomplish a common goal.
2. An ability to apply knowledge of computing, algorithmic principles, and computer science and engineering theory in the modeling and design of computer-based systems to real-world problems.
3. An ability to design, implement, and evaluate a computer-based system or process within realistic constraints such as economic, environmental, social, health and safety, manufacturability, and sustainability.
4. An ability to analyze a problem, and identify, formulate and use the appropriate computing and engineering requirements for obtaining its solution.
5. An ability to engage in continuing professional development and life-long learning and use current techniques, skills, and tools necessary for computing and engineering practice.
6. An ability to communicate technical information orally, in writing, and in presentations effectively.
7. An ability to acknowledge the importance of professional development by pursuing higher studies and undertaking research career.

Total credits - 166

Breakup of the credits category wise

Category	No of courses	Credits
Basic Applied Sciences	05	15
Core courses	39	88
Elective courses	11	33
Project work (Mini project/Major project/ Colloquium)	03	20
Any other (Humanities)	05	10
Total	63	166

Breakup of the credits semester wise

Semester/ Projects	No of courses	Credits
I	9	21
II	9	22
III	9	20
IV	10 (7 core+2electives+1 Summer Project)	21+03=24
V	8 (6 core+2electives)	20
VI	8 (5 core+3 electives)	20
VII	8 (4 core + 3 elective+1 Colloquium)	21
VIII	2 (Major Project +1 elective)	18
Total	63	166

Semester wise courses

Semester I				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCAS-1101	Engineering Physics	3-0-0	3
2.	BCAS-1102	Mathematics-I	3-1-0	4
3.	BCCS-1101	Computer Programming: Concepts and Practice	3-0-0	3
4.	BCCS-1102	Foundations of Computer Science	2-0-2	3
5.	BCHS-1101	Communication Skills	2-0-0	2
6.	BCHS-1102	Ethics and Human Values	2-0-0	2
7.	BCAS-1103	Engineering Physics Lab	0-0-2	1
8.	BCCS-1103	Computer Programming Lab	0-0-4	2
9.	BCHS-1103	Communication Skills Lab	0-0-2	1
		Total Credits		21

Semester II				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCAS-1201	Mathematics-II	3-1-0	4
2.	BCCS-1201	Data Structures	3-0-0	3
3.	BCCS-1202	Data Base Systems	3-0-0	3
4.	BCAS-1202	Discrete Mathematical Structures	2-1-0	3
5.	BCCS-1203	Digital Circuits System	3-0-0	3
6.	BCHS-1201	Principles and Practices of Management	3-0-0	3
7.	BCCS-1204	Data Structures Lab	0-0-2	1
8.	BCCS-1205	Digital Circuits System Lab	0-0-2	1
9.	BCCS-1206	Data Base Systems Lab	0-0-2	1
		Total Credits		22

Semester III				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCAS-2101	Probability and Statistics	3-0-0	3
2.	BCCS-2101	Analysis and Design of Algorithms	3-0-0	3
3.	BCCS-2102	Computer Organization and Architecture	3-0-0	3
4.	BCCS-2103	Operating System	3-0-0	3
5.	BCCS-2104	Object Oriented Programming Language	3-0-0	3
6.	BCHS-2101	Environmental Sciences	2-0-0	2
7.	BCCS-2105	Analysis and Design of Algorithms Lab	0-0-2	1
8.	BCCS-2106	Operating System Lab	0-0-2	1
9.	BCCS-2107	Object Oriented Programming Language Lab	0-0-2	1
Total Credits				20

Semester IV				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-2201	Theory of Computation	3-0-0	3
2.	BCCS-2202	Artificial Intelligence	3-0-0	3
3.	BCCS-2203	Computer Network*	3-0-0	3
4.	BCCS-2204	Software Engineering	3-0-0	3
5.		Elective-I	3-0-0	3
6.		Elective-II	3-0-0	3
7.	BCCS-2205	Artificial Intelligence Lab	0-0-2	1
8.	BCCS-2206	Computer Network Lab	0-0-2	1
9.	BCCS-2207	Software Engineering Lab	0-0-2	1
Total Credits				21

*Syllabus of computer network will comprise of concepts of data communication and computer networks

S. No.	Subject Code	Course	L-T-P	Credits
1.	BCCS-2999	Minor Project (Summer Project)	0-0-6	3

Semester V				
S. No.	Subject code	Title of the course	L-T-P	Credits
1.	BCCS-3101	Computer Graphics	3-0-0	3
2.	BCCS-3102	Data Mining and Data Warehouse	3-0-0	3
3.	BCCS-3103	Information Security Systems	3-0-0	3
4.	BCCS-3104	Compiler Design	3-0-0	3
5.		Elective-I	3-0-0	3
6.		Elective-II	3-0-0	3
7.	BCCS-3105	Computer Graphics Lab	0-0-2	1
8.	BCCS-3106	Systems Software Lab	0-0-2	1
Total Credits				20

Semester VI				
S. No.	Subject	Title of the course	L-T-P	Credits

	Code			
1.	BCCS-3201	Graph Theory	3-0-0	3
2.	BCCS-3202	Machine Learning	3-0-0	3
3.	BCCS-3203	Cloud Computing	3-0-0	3
4.		Elective-I	3-0-0	3
5.		Elective-II	3-0-0	3
6.		Elective-III	3-0-0	3
7.	BCCS-3204	Machine Learning Lab	0-0-2	1
8.	BCCS-3205	Cloud Computing Lab	0-0-2	1
		Total Credits		20

Industrial Training: Students to undertake summer internships during summer break (May to July)

Semester VII				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-4101	Modeling and Simulation	3-0-0	3
2.	BCCS-4102	Big Data Analytics	3-0-0	3
3.	BCCS-4103	Fundamentals of Internet of Things	3-0-0	3
4.		Elective-I	3-0-0	3
5.		Elective-II	3-0-0	3
6.		Elective-III	3-0-0	3
7.	BCCS-4104	Simulation Lab	0-0-2	1
8.	BCCS-4105	Colloquium	0-0-4	2
		Total Credits		21

Semester VIII				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-4999	Major Project	0-0-30	15
2.		Elective-I	3-0-0	3
		Total Credits		18

Electives (Semester wise)

Semester IV				
S. No.	Subject code	Title of the course	L-T-P	Credits
1.		Information Retrieval and Extraction	3-0-0	3
2.		Parallel & Concurrent Programming	2-0-2	3
3.		Introduction to Robotics	3-0-0	3
4.		Digital Signal Processing	3-0-0	3
5.		Introduction to Nanoscience Technology	3-0-0	3
6.		Cryptography and Network Security	3-0-0	3
7.		Microelectronics	3-0-0	3
8.		Human Computer Interaction	3-0-0	3
9.		Communication Systems	3-0-0	3
10.		Scientific Computing and Numerical Methods	2-1-0	3
11.		Advanced Competitive Programming	1-0-4	3

Semester V				
S. No.	Subject Code	Title of the course	L-T-P	Credits

1.		Queuing Theory and Data Networks	3-0-0	3
2.		Mobile Robotics	3-0-0	3
3.		Introduction to Cognitive Science	3-0-0	3
4.		Digital Watermarking & Steganalysis	3-0-0	3
5.		Quantum Computing	3-0-0	3
6.		Molecular Nanoelectronics	3-0-0	3
7.		VLSI Design	3-0-0	3
8.		Cellular and Mobile Communication Systems	3-0-0	3
9.		Advanced Computer Architecture	3-0-0	3
10.		Internet of Things (IoT) and its Security	3-0-0	3

Semester VI				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.		Program Analysis Verification and Testing	3-0-0	3
2.		Parallel and Distributed Computing	3-0-0	3
3.		Decision Making and Expert Systems	3-0-0	3
4.		Nature Inspired Computing	3-0-0	3
5.		Computer Vision	3-0-0	3
6.		CAD for VLSI	3-0-0	3
7.		Embedded Robotics	3-0-0	3
8.		Image Processing	3-0-0	3
9.		Big data and Cloud computing	3-0-0	3

Semester VII				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.		System Biology	3-0-0	3
2.		Intelligent Systems and Interfaces	3-0-0	3
3.		Web Architecture Security	3-0-0	3
4.		Computer Systems Security	3-0-0	3
5.		Multimedia Systems	3-0-0	3
6.		VLSI Testing and Fault Tolerance	3-0-0	3
7.		Game Theory	2-1-0	3
8.		Wireless Sensor Networks	3-0-0	3
9.		Cyber Physical System Design	3-0-0	3
10.		On-Chip Interconnection Networks	3-0-0	3
11.		Information Theory and Coding	3-0-0	3

Semester VIII				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.		Randomized Algorithms	3-0-0	3
2.		Convex Optimization Techniques	2-1-0	3
3.		Complexity and Advanced Algorithm	3-0-0	3
4.		Semantics of Programming Languages	3-0-0	3
5.		Malware Analysis	3-0-0	3
6.		Information Security and Secure Coding	3-0-0	3
7.		Multi Agents and Application	3-0-0	3

8.		Special topics in AI	3-0-0	3
9.		System-on-Chip Design	3-0-0	3
10.		On-Chip Interconnection Networks	3-0-0	3
11.		Neurocomputing Architecture	3-0-0	3
12.		High Performance Computing	3-0-0	3
13.		Detection and Estimation Theory	3-0-0	3

The electives are arranged sequentially from 4th Semester to 8th Semester from seven verticals, namely,

1. Computing and Data Sciences
2. Networks and Distributed Processing
3. Security
4. AI and Robotics
5. Visual Information Processing
6. VLSI and Nanotechnology
7. Computer Architecture and System Design

Categories of Electives

1. Computing and Data Sciences

S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-9101	Convex Optimization Techniques	2-1-0	3
2.	BCCS-9102	Quantum Computing	3-0-0	3
3.	BCCS-9103	Complexity and Advanced Algorithm	3-0-0	3
4.	BCCS-9104	Reconfigurable Computing	3-0-0	3
5.	BCCS-9105	Parallel & Concurrent Programming	2-0-2	3
6.	BCCS-9106	Program Analysis Verification and Testing	3-0-0	3
7.	BCCS-9107	Randomized Algorithms	3-0-0	3
8.	BCCS-9108	Semantics of Programming Languages	3-0-0	3
9.	BCCS-9109	Game Theory	2-1-0	3
10.	BCCS-9110	Scientific Computing and Numerical Methods	2-1-0	3
11.	BCCS-9111	Advanced Competitive Programming	1-0-4	3
12.	BCCS-9112	Big Data and Cloud Computing	3-0-0	3
13.	BCCS-9113	Data Analytics	3-0-0	3

2. Networks and Distributed Processing

S.No	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-9201	Queuing Theory and Data Networks	3-0-0	3
2.	BCCS-9202	High Speed Networks/Internet Traffic - Measurement, Modelling and Analysis	3-0-0	3
3.	BCCS-9203	Cellular and Mobile Communication	3-0-0	3
4.	BCCS-9204	Wireless Sensor Networks	3-0-0	3
5.	BCCS-9205	Special Topics in Complex Networks	3-0-0	3
6.	BCCS-9206	Parallel and Distributed Computing	3-0-0	3
7.	BCCS-9207	Grid and Peer-to-Peer Computing	3-0-0	3
8.	BCCS-9208	Special Topics in Internet Technologies	3-0-0	3
9.	BCCS-9209	Next Generation Networks	3-0-0	3

10	BCCS-9210	Cognitive Network	3-0-0	3
11	BCCS-9211	Information Theory and Coding	3-0-0	3
12	BCCS-9212	Detection and Estimation Theory	3-0-0	3

3.Security

S. No.	Subject Code	Title of the course	L-T-	Credits
1.	BCCS-9301	Computer Security Audit and Assurance	3-0-0	3
2.	BCCS-9302	Cryptography and Network Security	3-0-0	3
3.	BCCS-9303	Computer Systems Security	3-0-0	3
4.	BCCS-9304	Web Architecture Security	3-0-0	3
5.	BCCS-9305	Cyber Security and Laws	3-0-0	3
6.	BCCS-9306	Malware Analysis	3-0-0	3
7.	BCCS-9307	IoT and its Security	3-0-0	3
8.	BCCS-9308	Formal methods for Security Verifications	3-0-0	3
9.	BCCS-9309	Modern Cryptology	3-0-0	3
10.	BCCS-9310	Specialized Course in cryptography	3-0-0	3
11.	BCCS-9311	Information Security and Secure Coding	3-0-0	3
12.	BCCS-9312	Digital Watermarking & Steganalysis	3-0-0	3

4.AI & Robotics

S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-9401	Microelectronics	3-0-0	3
2.	BCCS-9402	Introduction to Robotics	3-0-0	3
3.	BCCS-9403	Embedded Robotics	3-0-0	3
4.	BCCS-9404	Mobile Robotics	3-0-0	3
5.	BCCS-9405	Introduction to Cognitive Science	3-0-0	3
6.	BCCS-9406	Decision Making and Expert system	3-0-0	3
7.	BCCS-9407	Nature Inspired computing	3-0-0	3
8.	BCCS-9408	Intelligent Systems and Interfaces	3-0-0	3
9.	BCCS-9409	System Biology	3-0-0	3
10.	BCCS-9410	Multi Agents and Application	3-0-0	3
11.	BCCS-9411	Special topics in AI	3-0-0	3

5.Visual Information Processing

S.	Subject Code	Title of the course	L-T-	Credits
1.	BCCS-9501	Information Retrieval and Extraction	3-0-0	3
2.	BCCS-9502	Image Processing	3-0-0	3
3.	BCCS-9503	Digital Watermarking & Steganalysis	3-0-0	3
4.	BCCS-9504	Pattern Recognition	3-0-0	3
5.	BCCS-9505	Multimedia Systems	3-0-0	3
6.	BCCS-9506	Human Computer Interaction	3-0-0	3
7.	BCCS-9507	Computer Vision	3-0-0	3
8.	BCCS-9508	Digital Signal Processing	3-0-0	3

6.VLSI & Nanotechnology

S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-9601	Introduction to Nanoscience and Technology	3-0-0	3
2.	BCCS-9602	VLSI Design	3-0-0	3
3.	BCCS-9603	VLSI Testing and Fault Tolerance	3-0-0	3

4.	BCCS-9604	CAD for VLSI	3-0-0	3
5.	BCCS-9605	Nano electronics	3-0-0	3
6.	BCCS-9606	Synthesis of Digital Systems	3-0-0	3
7.	BCCS-9607	Integrated Circuit Technology	3-0-0	3
8.	BCCS-9608	Memory Design	3-0-0	3
9.	BCCS-9609	Low Power VLSI Design	3-0-0	3
10.	BCCS-9610	Energy Aware Computing	3-0-0	3
11.	BCCS-9611	Molecular Nanoelectronics	3-0-0	3

7. Computer Architecture and System Design

S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	BCCS-9701	Advanced Computer Architecture	3-0-0	3
2.	BCCS-9702	Cyber Physical System Design	3-0-0	3
3.	BCCS-9703	System-on-Chip Design	3-0-0	3
4.	BCCS-9704	On-Chip Interconnection Networks	3-0-0	3
5.	BCCS-9705	Trustworthy Systems Design	3-0-0	3
6.	BCCS-9706	Neurocomputing Architectures/High Performance Computing	3-0-0	3
7.	BCCS-9707	Advanced Compiler Design	3-0-0	3

**APPENDIX B: New Proposed Course Structure: IPG PROGRAMME
(B.TECH + M.TECH (IT))**

Programme features

- a) Credits should be properly defined for independent labs and theory subjects.
- b) Suggested total credit of the entire programme is 210. Semester wise credits are between 15 and 23.
- c) The distribution of course syllabus should be decided considering the requirement of Industry, Research and Entrepreneurship.
- d) The distribution of course syllabus should be decided considering the Science, Humanities and Engineering stream current requirements along with minor and major projects.
- e) One or two theory subjects should be in 10th semester and two theory subjects should be in 9th semester.
- f) Course in semesters should be restructured considering pre-requisite requirements.
- g) BTP structure would remain same (6 credits).
- h) Theory of Computation (ToC) / Compiler Design/ IoT/Big Data subject should be incorporated into the syllabus.

Total credits- 210

Overall credits breakup

Category	No. of courses	Credits
Basic Applied Sciences	08	25
Core Courses	52	114
Elective Courses	09	27
Project work (Mini project/Major project/ Colloquium)	04	30
Any other (Humanities)	05	14
Total	78	210

Breakup of the credits semester wise

Semester/ Projects	No of courses	Credits
I	8	21
II	9	21
III	9	22
IV	9	22
V	9 (8 core+1elective)	21
VI	10(6 core+2 electives+1 mini project+1 summer BTP project)	26
VII	9 (7 core + 2 elective)	21
VIII	9 (7 core+2 elective)	23
IX	4(1 core+1elective+1 colloquim+1Major project-I)	18
X	2(1 elective+ 1 Major project-II)	15
Total	78	210

Semester wise courses

Semester I				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	ITAS-1101	Mathematics-I *	3-1-0	4
2	ITAS-1102	Engineering Physics	4-0-0	4
3	ITIT-1101	Fundamentals of IT	3-0-0	3
4	ITIT-1102	Computer Programming	3-0-0	3
5	ITHS-1101	Language & Technical Communication Skills	2-0-2	3
6	ITIT-1103	Computer Programming Lab	0-0-4	2
7	ITAS-1103	Engineering Physics Lab	0-0-2	1
8	ITIT-1104	Fundamental of IT Lab	0-0-2	1
		Total Credits		21

Semester II				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	ITAS-1201	Mathematics –II*	3-1-0	4
2	ITHS-1201	Philosophy & Human Values	2-0-0	2
3	ITIT-1201	Digital Electronics	3-0-0	3
4	ITIT-1202	Data Structure	3-0-0	3
5	ITIT-1203	ICT Workshop	0-0-4	2
6	ITIT-1204	Object Oriented Programming	3-0-0	3
7	ITIT-1205	OOPS Lab	0-0-4	2
8	ITIT-1206	Digital Electronics Lab	0-0-2	1
9	ITIT-1207	Data Structure Lab	0-0-2	1
		Total Credits		21

Semester III				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	ITAS-2101	Mathematics –III*	3-1-0	4
2	ITIT-2101	Bio-Medical Engineering	3-0-0	3
3	ITIT-2102	Computer Networks	3-0-0	3
4	ITHS-2101	Organizational Behavior	3-0-0	3
5	ITIT-2103	Computer Organization & Architecture	3-0-0	3
6	ITIT-2104	Database Management Systems	3-0-0	3
7	ITIT-2105	Computer Networks Lab	0-0-2	1
8	ITIT-2106	Computer Organization & Architecture Lab	0-0-2	1
9	ITIT-2107	DBMS Lab	0-0-2	1
		Total Credits		22

Semester IV				
S. No.	Subject code	Title of the course	L-T-P	Credits
1	ITAS-2201	Mathematics- IV*	3-1-0	4
2	ITIT-2201	Theory of Computation	3-0-0	3
3	ITAS/ITHS-2202/2201???	Business Analytics	3-0-0	3
4	ITIT-2202	Design & Analysis of Algorithms	3-0-0	3
5	ITIT-2203	Artificial Intelligence	3-0-0	3
6	ITIT-2204	Operating Systems	3-0-0	3
7	ITIT-2205	Design & Analysis of Algorithms Lab	0-0-2	1
8	ITIT-2206	Operating Systems Lab	0-0-2	1
9	ITIT-2207	Artificial Intelligence Programming Lab	0-0-2	1
Total Credits				22

Semester V				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	ITIT-3101	Embedded System Design	3-0-0	3
2	ITIT-3102	Computer Graphics	3-0-0	3
3	ITIT-3103	Software Engineering	3-0-0	3
4	ITIT-3104	Information System Security	3-0-0	3
5	ITIT-3105	Signals & Systems	3-0-0	3
6		Elective-I	3-0-0	3
7	ITIT-3106	Software Engineering Lab	0-0-2	1
8	ITIT-3107	Computer Graphics Lab	0-0-2	1
9	ITIT-3108	Embedded System Design Lab	0-0-2	1
Total Credits				21

Semester VI				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	ITIT-3201	Cloud Computing	3-0-0	3
2	ITIT-3202	Wireless Communication Technologies	3-0-0	3
3	ITAS-3201	Modelling & Simulation	3-0-0	3
4	ITIT-3203	Mini Project	0-0-4	2
5		Elective-I	3-0-0	3
6		Elective-II	3-0-0	3
7	ITAS-3202	M&S Lab	0-0-2	1
8	ITIT-3204	Cloud Computing Lab	0-0-2	1
9	ITIT-3205	Wireless Communication Technologies Lab	0-0-2	1
Total Credits				20

S. No.	Subject Code	Title of the course	L-T- P	Credits
1.	ITIT-3999	B Tech Project	0-0-12	6

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Semester VII				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	ITIT-4101	Mobile Computing	3-0-0	3
2	ITIT-4102	Multiobjective Optimization Methods	3-0-0	3
3	ITIT-4103	Machine Learning	3-0-0	3
4	ITIT-4104	Data Mining	3-0-0	3
5		Elective-I	3-0-0	3
6		Elective-II	3-0-0	3
7	ITIT-4105	Mobile computing Lab	0-0-2	1
8	ITIT-4106	Data Mining Lab	0-0-2	1
9	ITIT-4107	Machine Learning Lab	0-0-2	1
		Total Credits		21

Semester VIII				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1	ITIT-4201	Graph Theory/Compiler Design	3-0-0	3
2	ITIT-4202	Big Data Analytics	3-0-0	3
3	ITIT-4203	Natural Language Processing	3-0-0	3
4	ITIT-4204	Soft Computing	3-0-0	3
5		Elective-I	3-0-0	3
6		Elective-II	3-0-0	3
7	ITHS-4201	Research Methodology	3-0-0	3
8	ITIT-4205	Big data & Data Analytics Lab	0-0-2	1
9	ITIT-4206	Natural Language Processing Lab	0-0-2	1
		Total Credits		23

Industrial Training: Students to undertake summer internships during summer break (May to July)

Semester IX				
S.No	Subject Code	Title of the course	L-T-P	Credits
1	ITIT-5101	Colloquium based on Summer Internship	0-0-8	4
2	ITIT-5102	Fundamentals of IoT	3-0-0	3
		Elective-I	3-0-0	3
4	ITIT-5199	Major Project Part-I	0-0-16	8
		Total Credits		18

Semester X				
S.No	Subject code	Title of the course	L-T-P	Credits
1		Elective-I	3-0-0	3
2	ITIT-5299	Major Project Part-II	0-0-24	12
		Total Credits		15

*** While designing detailed course contents of Mathematics I-IV, care to be taken that aspects of Discrete Mathematics/Graph Theory/Probability & Statistics etc. are also considered**

Electives as per the following different groups /streams to be finalized

1. Computing and Data Sciences
2. Networks and Distributed Processing
3. Security
4. AI and Robotics
5. Visual Information Processing
6. VLSI and Nanotechnology
7. Computer Architecture and System Design

1. Computing and Data Sciences

S.No.	Subject code	Title of the course	L-T-	Credits
1.	ITIT-9101	Convex Optimization Techniques	2-1-	3
2.	ITIT-9102	Quantum Computing	3-0-	3
3.	ITIT-9103	Complexity and Advanced Algorithm	3-0-	3
4.	ITIT-9104	Reconfigurable Computing	3-0-	3
5.	ITIT-9105	Parallel & Concurrent Programming	2-0-	3
6.	ITIT-9106	Program Analysis Verification and Testing	3-0-	3
7.	ITIT-9107	Randomized Algorithms	3-0-	3
8.	ITIT-9108	Semantics of Programming Languages	3-0-	3
9.	ITIT-9109	Game Theory	2-1-	3
10.	ITIT-9110	Scientific Computing and Numerical Methods	2-1-	3
11.	ITIT-9111	Advanced Competitive Programming	1-0-	3
12.	ITIT-9112	Big Data and Cloud Computing	3-0-	3
13.	ITIT-9113	Data Analytics	3-0-	3

2. Networks and Distributed Processing

S. No.	Subject code	Title of the course	L-T-P	Credits
1.	ITIT-9201	Queuing Theory and Data Networks	3-0-0	3
2.	ITIT-9202	High Speed Networks/Internet Traffic -Measurement, Modelling and Analysis	3-0-0	3
3.	ITIT-9203	Cellular and Mobile Communication Systems	3-0-0	3
4.	ITIT-9204	Wireless Sensor Networks	3-0-0	3
5.	ITIT-9205	Special Topics in Complex Networks	3-0-0	3
6.	ITIT-9206	Parallel and Distributed Computing	3-0-0	3
7.	ITIT-9207	Grid and Peer-to-peer computing	3-0-0	3
8.	ITIT-9208	Special Topics in Internet Technologies	3-0-0	3
9.	ITIT-9209	Next Generation Networks	3-0-0	3
10.	ITIT-9210	Cognitive network	3-0-0	3
11.	ITIT-9211	Information Theory and Coding	3-0-0	3
12.	ITIT-9212	Detection and Estimation Theory	3-0-0	3

3. Security

S. No.	Subject code	Title of the course	L-T-P	Credits
1.	ITIT-9301	Computer Security Audit and	3-0-0	3
2.	ITIT-9302	Cryptography and Network	3-0-0	3
3.	ITIT-9303	Computer Systems Security	3-0-0	3
4.	ITIT-9304	Web Architecture Security	3-0-0	3
5.	ITIT-9305	Cyber Security and Laws	3-0-0	3
6.	ITIT-9306	Malware Analysis	3-0-0	3
7.	ITIT-9307	IoT and its security	3-0-0	3
8.	ITIT-9308	Formal methods for Security	3-0-0	3
9.	ITIT-9309	Modern Cryptology	3-0-0	3
10.	ITIT-9310	Specialized Course in	3-0-0	3
11.	ITIT-9311	Information Security and Secure	3-0-0	3
12.	ITIT-9312	Digital Watermarking &	3-0-0	3

4. AI & Robotics

S. No.	Subject code	Title of the course	L-T-P	Credits
1.	ITIT-9401	Microelectronics	3-0-0	3
2.	ITIT-9402	Introduction to Robotics	3-0-0	3
3.	ITIT-9403	Embedded Robotics	3-0-0	3
4.	ITIT-9404	Mobile Robotics	3-0-0	3
5.	ITIT-9405	Introduction to Cognitive	3-0-0	3
6.	ITIT-9406	Decision Making and Expert	3-0-0	3
7.	ITIT-9407	Nature Inspired computing	3-0-0	3
8.	ITIT-9408	Intelligent Systems and	3-0-0	3
9.	ITIT-9409	System Biology	3-0-0	3
10.	ITIT-9410	Multi Agents and Application	3-0-0	3
11.	ITIT-9411	Special topics in AI	3-0-0	3

5. Visual Information Processing

S. No.	Subject code	Title of the course	L-T-P	Credits
1.	ITIT-9501	Information Retrieval and	3-0-0	3
2.	ITIT-9502	Image Processing	3-0-0	3
3.	ITIT-9503	Digital Watermarking &	3-0-0	3
4.	ITIT-9504	Pattern Recognition	3-0-0	3
5.	ITIT-9505	Multimedia Systems	3-0-0	3
6.	ITIT-9506	Human Computer Interaction	3-0-0	3
7.	ITIT-9507	Computer Vision	3-0-0	3
8.	ITIT-9508	Digital Signal Processing	3-0-0	3

6. VLSI & Nanotechnology

S. No.	Subject code	Title of the course	L-T-	Credits
1.	ITIT-9601	Introduction to Nanoscience and Technology	3-0-0	3
2.	ITIT-9602	VLSI Design	3-0-0	3
3.	ITIT-9603	VLSI Testing and Fault Tolerance	3-0-0	3
4.	ITIT-9604	CAD for VLSI	3-0-0	3
5.	ITIT-9605	Nano electronics	3-0-0	3
6.	ITIT-9606	Synthesis of Digital Systems	3-0-0	3
7.	ITIT-9607	Integrated Circuit Technology	3-0-0	3
8.	ITIT-9608	Memory Design	3-0-0	3
9.	ITIT-9609	Low Power VLSI Design	3-0-0	3
10.	ITIT-9610	Energy Aware Computing	3-0-0	3
11.	ITIT-9611	Molecular Nanoelectronics	3-0-0	3

7. Computer Architecture and System Design

S.No.	Subject code	Title of the course	L-	Credits
1.	ITIT-9701	Advanced Computer Architecture	3-0-	3
2.	ITIT-9702	Cyber Physical System Design	3-0-	3
3.	ITIT-9703	System-on-Chip Design	3-0-	3
4.	ITIT-9704	On-Chip Interconnection Networks	3-0-	3
5.	ITIT-9705	Trustworthy Systems Design	3-0-	3
6.	ITIT-9706	Neurocomputing Architectures/High Performance Computing	3-0-0	3
7.	ITIT-9707	Advanced Compiler Design	3-0-	3

APPENDIX C: New Proposed Course Structure: M. TECH IN VARIOUS STREAMS

- M Tech (Computer Networks)**
- M Tech (Digital Communications)**
- M Tech (Information Security)**
- M Tech (VLSI & Embedded System)**

M Tech (Computer Networks)

Programme Philosophy

The Master of Technology Course in Advanced Networks provides students with a broad foundation and an in-depth understanding of modern networking. The core courses introduced include a comprehensive study of computer networks that covers wireless network technologies, network designing and security of the networks. The elective courses have been introduced in three elective clusters, one for each semester. A student should opt electives from the respective semester electives cluster. The program is designed to develop student's skills with extensive knowledge and hands-on experience to analyze, design and implement cutting-edge computer networking solutions and technologies.

Expected competencies from students

Upon completion of the academic requirements, post graduate students of Advanced Networks will be able to demonstrate:

1. Fundamental and advanced knowledge of network modeling, or security.
2. Proficiency in concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance and implementing new technologies.
3. Advanced knowledge of IoT protocols and networks; issues involved in wireless networks.
4. Competent solutions for networking and interdisciplinary problems related to security, computing and networks.
5. Effectively communicate technical information verbally, in writing, and in presentations.

Total credits - 62

Breakup of the credits category wise

Category	No of courses	Credits
Basic applied sciences	00	00
Core courses	07	23
Elective courses	05	15
Project work (mini project/major project etc.)	3 (2 MTP +1 Seminar)	19
Report Writing, Research methodology, Professional Ethics	3	5
Total	18	62

Breakup of the credits semester wise

Semester	No of courses	Credits
I	7(4 Core+2 Electives+2 audit)	20
II	6 (3 Core + 2 Electives +1)	19
III	4 (1 Elective+ Seminar +1+ Major Project-I)	11
IV	1 (1 Major Project-II)	12
Total	18	62

Semester wise courses

Semester I				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTAS-6101	Modelling & Simulation	3-1-0	4
2.	MTCN-6101	Advanced Network Technology	3-0-2	3
3.	MTCN-6102	Network Management & Security	3-0-0	3
4.		Elective-I	3-0-0	3
5.		Elective-II	3-0-0	3
6.	MTCN-6103	Scientific Computing Lab-I	0-0-6	3
7.	MTHS-6101	Professional Ethics	0-0-2	1
8.	MTCN-6104	Generic Computing Lab		Audit
		Total Credits		20

Semester II				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTCN-6201	Wireless Network Technology	3-0-0	3
2.	MTCN-6202	Network design and Optimization	3-1-0	4
3.	MTHS-6201	Research Methodology	2-0-2	3
4.		Elective-III	3-0-0	3
5.		Elective-IV	3-0-0	3
6.	MTCN-6203	Scientific Computing Lab-II	0-0-6	3
		Total Credits		19

Semester III				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTHS-7101	Technical Report Writing	0-0-2	1
2.	MTCN-7102	Seminar	0-0-2	1
3.		Elective-V	3-0-0	3
4.	MTCN-7199	Major Project Part-I	0-0-12	6
		Total Credits		11

Semester IV				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTCN-7299	Major Project Part-II	0-0-24	12
		Total Credits		12

Electives (Semester Wise)

Semester I				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTCN-9101	Mobile Computing	3-0-0	3
2.	MTCN-9102	Stochastic Process and Queuing Theory	3-0-0	3
3.	MTCN-9103	Fibre Optic Networks	3-0-0	3
4.	MTCN-9104	Grid and Peer-to-peer computing	3-0-0	3
5.	MTCN-9105	Parallel and Distributed Computing	3-0-0	3
6.	MTCN-9106	Advanced Graph Theory	3-0-0	3

Semester II				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTCN-9201	Cloud Computing and Cloud security	3-0-0	3
2.	MTCN-9202	Cyber Physical Networks	3-0-0	3
3.	MTCN-9203	IoT protocols and Security	3-0-0	3
4.	MTCN-9204	Storage Area Networks	3-0-0	3
5.	MTCN-9205	Next Generation Networks	3-0-0	3
6.	MTCN-9206	High Speed Networks	3-0-0	3

Semester III				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTCN-9301	Network Embedded System	3-0-0	3
2.	MTCN-9302	Convergent Networks	3-0-0	3
3.	MTCN-9303	Tactile Networks	3-0-0	3
4.	MTCN-9304	Machine Learning and Autonomous Systems	3-0-0	3

M Tech (Digital Communication)

Programme Philosophy

The Master of Technology Course in Digital Communication provides students with a broad foundation and an in-depth theoretical understanding of digital communication techniques and wireless communication technologies. The core courses include broad aspects of digital communication and the elective courses cater the students for developing in-depth knowledge in their selected area of study. The core also includes a course in mathematics to prepare them for advanced studies. There are 4 elective courses listed and the list is open for modification based on the need from the industry/academia. A student can opt electives depending upon his/her interest to fulfill the semester credits. The program also offers sufficient curriculum to prepare the students for research through audit courses and one year of major project spread through two semesters. The program is also designed to develop student's skills with extensive knowledge and hands-on experience to analyze, design and implement cutting-edge communication solutions and technologies.

Expected competencies from students

Upon completion of the academic requirements, post graduate students of Digital Communication will be able to demonstrate:

1. Proficiency in concepts and theories of digital communication and relate to the technologies, analyzing performance and implementing new technologies.
2. In-depth training in digital communication, wireless mobile networks, mobile technologies, etc.
3. Competence in carrying out independent research work by choosing research problems and developing it on their own.
4. Hands-on training and practical exposure to digital communication concepts which steer graduates towards exploring career options as communication engineers.
5. To effectively communicate orally and in writing.

Total credits - 60

Breakup of the credits category wise

Category	No of courses	Credits
Basic applied sciences	0	0
Core courses	9	28
Elective courses	4	12
Project work (mini project/major project etc.)	2	18
Any other (pl specify) Lab, Seminar, Report Writing	2+2 (audit)	2
Total	17+2 (audit)	60

reakup of the credits semester wise

Semester	No of courses	Credits
I	5 core+1 elective+2 (audit)	19
II	4 core+ 2 elective	18
III	2 core+1 elective+1 Major project-I	11
IV	1 Major project-II	12
Total	17+2 (audit)	60

Semester wise courses

Semester I				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTDC-6101	Applied Mathematics for Communication Engineering	3-1-0	4
2.	MTDC-6102	Digital Communication	3-0-0	3
3.	MTDC-6103	Information Theory and Coding	3-0-0	3
4.	MTAS-6101	Modeling & Simulation	3-0-0	3
5.		Elective-I	3-0-0	3
6.	MTDC-6104	Scientific Computing Laboratory -I (MATLAB, NS2, OPNET etc)	0-0-6	3
7.	MTHS-6101	Professional Ethics		Audit
8.	MTDC-6105	Generic Computing Laboratory		Audit
		Total credits		19

Semester II				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTHS-6201	Research Methodology	3-0-0	3
2.	MTDC-6201	Detection and Estimation Theory	3-0-0	3
3.	MTDC-6202	Advanced Mobile Communication System	3-0-0	3
4.		Elective-II	3-0-0	3
5.		Elective-III	3-0-0	3
6.	MTDC-6203	Scientific Computing Laboratory-II (Minor Project Based)	0-0-6	3
		Total credits		18

Semester III				
S. No.	Subject code	Title of the course	L-T-P	Credits
1.	MTHS-7101	Technical Report Writing	0-0-2	1
2.	MTDC-7102	Seminar	0-0-2	1
3.		Elective-IV	3-0-0	3
4.	MTDC-7199	Major Project Part-I	0-0-12	6
		Total credits		11

Semester IV				
S. No.	Subject code	Title of the course	L-T-P	Credits
1.	MTDC-7299	Major Project Part-II	0-0-24	12
Total credits				12

Electives *

S. No.	Subject Code	Title of the course	L-T-P	Credits
1.	MTDC-9101	Queuing Theory	3-0-0	3
2.	MTDC-9102	Computer Graph Theory	3-0-0	3
3.	MTDC-9103	Computer Networks	3-0-0	3
4.	MTDC-9104	Internetwork Communication	3-0-0	3
5.	MTDC-9105	Optical Communication	3-0-0	3
6.	MTDC-9106	Adaptive Signal Processing	3-0-0	3
7.	MTDC-9107	Mobile Computing	3-0-0	3
8.	MTDC-9108	Object Oriented Programming (OOPS) + Data Structures	3-0-0	3
9.	MTDC-9109	Digital Signal Processing	3-0-0	3
10.	MTDC-9110	Modern Cryptography	3-0-0	3
11.	MTDC-9111	Game Theory and its Application	3-0-0	3
12.	MTDC-9112	Speech and Audio Signal Processing	3-0-0	3
13.	MTDC-9113	Cognitive Radio	3-0-0	3
14.	MTDC-9114	Advanced Networks	3-0-0	3
15.	MTDC-9115	IoT and its Security	3-0-0	3
16.	MTDC-9116	RF Engineering for wireless networks	3-0-0	3
17.	MTDC-9117	Optimization Techniques	3-0-0	3
18.	MTDC-9118	Microwave & Antennas	3-0-0	3

*** - The list is dynamic and can be expanded based on the requirement of Industry and Academia**

Name of the programme : M.Tech. in Information Security

Programme Philosophy

The Master of Technology Course in Information Security provides students with a broad foundation and an in-depth theoretical understanding of aspects of security in the cyber space. The core courses include a comprehensive study of mathematical foundations, secure system design and secure programming, distributed system security including a few emerging topics. There are 18 elective courses listed and split into three different verticals. This will enable a student to specialize in one vertical with in Information Security domain. The list is open for modification based on the need from the industry/academia.

Expected competencies from students

Upon completion of the academic requirements, post graduate students of Information Security are expected to demonstrate:

1. Fundamental and advanced knowledge of security domain language, mathematics for communication, as well as better communication skills.
2. Proficiency in concepts and theories of security and relate to the technologies, analyzing performance and implementing new technologies.
3. Equipped with competency to work with relevant industry
4. Competence in carrying out independent and team research
5. Effectively communicate technical information.

Total credits - 60

Breakup of the credits category wise

Category	No of courses	Credits
Basic applied sciences	00	00
Core courses	06	20
Elective courses	05	14
Project work (Mini/major project etc.)	02+01=03	18
Laboratory	03	03
Seminar and Report Writing, Research methodology, Professional Ethics	03+01=04	05+01=06
Total	14+01=15	60+01=61

Breakup of the credits semester wise

Semester	No of courses	Credits
1	08 (3 core+2 Elective+1+2 labs)	19
2	07 (3 core+2 Elective+1+1 lab)	20
3	03 +01=04(1 Elective+1+1 Seminar+Major Project Part-I)	09+01=10
4	01 (Major Project Part-II)	12
Total	17+01=18	60+01=61

Semester I

S. No.	Subject Code	Course Title	L	T	P	Credits
1.	MTAS-6101	Modelling and Simulation	3	0	0	3
2.	MTIS-6101	Modern Cryptography	3	1	0	4
3.	MTIS-6102	Introduction to Computer and Network Security	3	0	0	3
4.		Elective – I	3	0	0	3
5.		Elective II	3	0	0	3
6.	MTIS-6103	Computer and Network Security laboratory	0	0	2	1
7.	MTAS-6102	Modeling and Simulation laboratory	0	0	2	1
8.	MTHS-6101	Professional Ethics	2	0	0	1
		Total				19

Semester II

S. No.	Subject Code	Course Title	L	T	P	Credits
1.	MTIS-6201	Information Security Risk Management	3	0	0	3
2.	MTIS-6202	Data Mining and Machine Learning	3	0	0	3
3.	MTIS-6203	Formal Techniques for Software reliability	3	1	0	4
4.	MTHS-6201	Research Methodology	2	0	2	3
5.		Elective III	3	0	0	3
6.		Elective IV	3	0	0	3
7.	MTIS-6204	Data Mining and Machine Learning Laboratory	0	0	2	1
		Total				20

Semester III

S. No.	Subject Code	Course Title	L	T	P	Credits
1.	MTIS-7101	Technical Report Writing	0	0	2	1
2.	MTIS-7101	Seminar	0	0	2	1
3.		Elective V	2	0	0	2
4.	MTIS-7199	Major Project Part I				6
		Total				10

Semester IV

S. No.	Subject Code	Course Title	L	T	P	Credits
1.	MTIS-7299	Major Project Part II				12
		Total				12

Total credits to be earned over 4 semesters are 60.

Electives *

S. No.	Subject Code	Course Title	L	T	P	Credits
Application Security						
1.	MTIS-9101	Secure Software Systems	3	0	0	3
2.	MTIS-9102	Database Security	3	0	0	3
3.	MTIS-9103	Web Architecture Security	3	0	0	3
4.	MTIS-9104	Computer Security Audit and Assurance #	3	0	0	3
5.	MTIS-9105	Secure Enterprise Computing	3	0	0	3
6.	MTIS-9106	Digital Watermarking and Steganalysis	3	0	0	3
7.	MTIS-9107	Advanced Distributed System Security	3	0	0	3
8.	MTIS-9108	Analysis and Verification of Cryptographic Protocols	3	0	0	3
9.	MTIS-9109	Game Theory and Applications #	3	0	0	3
10.	MTIS-9110	Computational Number Theory	3	0	0	3
Security Analysis						
11.	MTIS-9201	Design and Analysis of Secured Networked Systems	3	0	0	3
12.	MTIS-9202	Cyber Security and IoT	3	0	0	3
13.	MTIS-9203	Cloud Security: Architecture and Technologies	3	0	0	3
14.	MTIS-9204	Public Key Infrastructure and managing E-Security	3	0	0	3
15.	MTIS-9205	Applied Cryptography	3	0	0	3
16.	MTIS-9206	Information Systems Security Risk Analysis	3	0	0	3
17.	MTIS-9207	Malware Analysis	3	0	0	3
18.	MTIS-9208	Privacy and Security for online Social Networks	3	0	0	3
Cyber-Threat Intelligence						
19.	MTIS-9301	Cyber Threat Intelligence	3	0	0	3
20.	MTIS-9302	Cyber Forensics Technologies and Requirements	3	0	0	3
21.	MTIS-9303	Cyber-Physical System Security	3	0	0	3
22.	MTIS-9304	Intrusion Detection and Prevention	3	0	0	3
23.	MTIS-9305	Information Assurance and Analysis	3	0	0	3
24.	MTIS-9306	Fundamentals of Intrusion Analysis	3	0	0	3

***The list can vary based on the requirement of Industry and Academia**
Compulsory specialization electives

Name of the programme -- VLSI and Embedded System

Programme Philosophy

VLSI and Embedded System post graduate program has been characterized by providing broad background courses covering the fundamentals on Integrated Circuit (IC) and system design. The current VLSI technology involves an integrated approach of applied science, electrical engineering, and computer science and engineering. The program focuses on in-depth concepts for IC and system design via core courses like MOS VLSI Circuit Design, Mixed Signal Design, CAD Algorithm, and Embedded System Design. The program would exercise students on topics from different levels to meet the challenges of current industry through state-of-the-art technical knowledge and innovative approaches. This program will have great impact on India's readiness in industry-ready highly skilled manpower in VLSI and Embedded System development area.

More specifically, this will provide the state-of-the-art research, industry-institute interaction platform for collaborative research and development in VLSI technology and embedded systems with industries and institute of higher learning in India and abroad.

Expected competencies from students

Write at least 6-7 competencies skills expected as an outcome of the programme

1. Capable to apply knowledge and skills of VLSI and Embedded System to solve multidisciplinary engineering problems.
2. Ability to develop expertise in design, characterization and testing for VLSI and Embedded applications.
3. Ability to provide solutions through state-of-the-art research as per the need of society and industry.
4. Ability to develop working prototype of state-of-the-art Systems/ Sub-systems/ System on Chip (SOCs) for current and future generation processor and multicore embedded system.
5. Ability to develop formal cooperative learning to foster design innovation and create thinking.
6. Capability to understand professional and ethical responsibilities.
7. Capability to communicate effectively, orally as well as in writing.
8. Ability to work independently as well as part of teams.

Total credits - 60

Breakup of the credits category wise

Category	No of courses	Credits
Basic applied sciences	00	00
Core courses	09	21
Elective courses	05	15
Project work (Mini project/Major project)	3 (2 MTP + 1 Seminar)	19
Professional Ethics, Research Methodology, Technical writing	3 + 1 (audit)	5
Total	20 + 1 (audit)	60

Breakup of the credits semester wise

semester	No of courses	Credits
1	8 (5 Core + 2 Electives + 1) + 1 (audit)	19
2	7 (4 Core + 2 Electives + 1)	18
3	4 (2 Projects + 1 Elective + 1)	11
4	1 (1 Project)	12
Total	20 + 1 (audit)	60

Semester wise courses

Semester I				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	MTES-6101	MOS VLSI Circuit Design	3-0-0	3
2	MTES-6102	CAD Algorithms	3-0-0	3
3	MTES-6103	Device Modelling and Simulation	3-1-0	4
4		Elective I	3-0-0	3
5		Elective II	3-0-0	3
6	MTES-6104	VLSI Circuit Lab	0-0-2	1
7	MTES-6105	CAD Lab	0-0-2	1
8	MTHS-6101	Professional Ethics	0-0-2	1
9	MTES-6106	Generic Computing		Audit
			Total credits	19

Semester II				
S. No.	Subject code	Title of the course	L-T-P	Credits
1	MTES-6201	Mixed Signal Design	3-0-0	3
2	MTES-6202	Embedded System Design	3-0-0	3
3		Elective I	3-0-0	3
4		Elective II	3-0-0	3
5	MTHS-6201	Research Methodology	3-0-0	3
6	MTES-6203	Analog Circuit Lab	0-0-4	2
7	MTES-6204	Embedded Lab	0-0-2	1
			Total credits	18

Semester III				
S. No.	Subject code	Title of the course	L-T-P	Credits
1		Elective-I	3-0-0	3
2	MTHS-7101	Technical Writing	0-0-2	1
3	MTHS-7101	Seminar	0-0-2	1
4	MTHS-7199	Major Project part I		6
			Total credits	11

Semester IV				
S. No.	Subject Code	Title of the course	L-T-P	Credits
1	MTHS-7299	Major Project part II		12
			Total credits	12

List of Electives for VLSI and Embedded System

List of Electives for Semester I

S. No.	Subject Code	Course	L-T-P	Credits
1.	MTHS-9101	Integrated Circuit Technology	3-0-0	3
2.	MTHS-9102	VLSI Design	3-0-0	3
3.	MTHS-9103	Synthesis of Digital System	3-0-0	3
4.	MTHS-9104	VLSI Testing and Testability	3-0-0	3

List of Electives for Semester II

S. No.	Subject Code	Course	L-T-P	Credits
1.	MTHS-9201	Memory Design	3-0-0	3
2.	MTHS-9202	Analog IC design	3-0-0	3
3.	MTHS-9203	VLSI Architecture	3-0-0	3
4.	MTHS-9204	Hardware Security	3-0-0	3
5.	MTHS-9205	VLSI Physical Design Automation	3-0-0	3
6.	MTHS-9206	Nanoelectronics	3-0-0	3

List of Electives for Semester III

S. No.	Subject Code	Course	L-T-P	Credits
1.	MTHS-9301	Energy Aware Computing	3-0-0	3
2.	MTHS-9302	Low Power VLSI Design	3-0-0	3
3.	MTHS-9303	Spintronics: Principles and Devices	3-0-0	3
4.	MTHS-9304	System Level Design and Modelling	3-0-0	3
5.	MTHS-9305	Hardware Software Co-design	3-0-0	3
6.	MTHS-9306	VLSI Digital Signal Processing Systems	3-0-0	3

APPENDIX D: New Proposed Course Structure: IPG(MBA)

Name of the programme – IPG(MBA)

Programme Philosophy

The main objective of this unique IPG MBA program is to create professionals who are capable of integrating technologies of different levels for offering competitive edge to industrial processes and business. The program offers a synchronized curriculum covering facets of IT and management. Keeping in line with market requirements, it is essential to groom techno managers who are adept in handling challenging Management as well as IT issues.

The IPG MBA program can be divided broadly in two halves. The first half aims to build the strong technical foundations in IT domain, and is highly structured. The second half focuses on delivering a unique leadership and management educational experience. The programme offers an array of opportunities for education, personal and career development, research, community involvement, and social interaction. It provides a lot of flexibility in selecting courses according to one's liking and strength. The viability of programme demonstrates suitable combination of knowledge with actions, and output driven orientation so as to cater to the corporate and societal requirements.

Expected competencies from students

1. Capable to apply skills of IT domain to develop technology based solutions for real-world managerial problems.
2. Ability to work as part of teams as well as a team leader.
3. Proficiency in interpersonal and business communication.
4. Ability to leverage technology while harnessing their problem solving and analytical skills.
5. Ability to use their time and project management skills towards entrepreneurship endeavors.
6. Competent to use strategic thinking and planning abilities in complex managerial situations while understanding professional and ethical responsibilities.
7. Ability to provide solutions through function-specific skills and research as per the need of society and industry.

Total credits: 225

Breakup of the credits category wise

Category	No. of courses	Credits
Basic applied Sciences	8	25
IT Core Courses	37	80
IT/MG Electives	3	9
Management Core Courses	22	65
Management Electives	5	15
Mini/Major Projects	4	28
Seminar/colloquium/Internship	1	3
Total	80	225

Breakup of the credits semester wise

Semester	No of courses	Credits
I	8	21
II	9	21
III	9	22
IV	10	26
V	9	20
VI	10(9 course + 1 summer BTP project)	26
VII	11	24
VIII	12	24
IX	7 + 1 Major Project Part I	26
X	1 Major Project Part II	15
Total		225

IPG(MBA)**FIVE YEARS INTEGRATED PROGRAMME COURSE CURRICULUM**

Semester I				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMAS-1101	Mathematics – I *	3-1-0	4
2.	IMAS-1102	Engineering Physics	4-0-0	4
3.	IMIT-1101	Fundamental of CS	3-0-0	3
4.	IMIT-1102	Computer Programming	3-0-0	3
5.	IMHS-1101	Language & Technical Communication Skills	2-0-2	3
6.	IMIT-1103	Computer Programming Lab	0-0-4	2
7.	IMAS-1103	Engineering Physics Lab	0-0-2	1
8.	IMIT-1104	Fundamental of CS Lab	0-0-2	1
Total Credits				21

Semester II				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMAS-1201	Mathematics – II*	3-1-0	4
2.	IMHS-1201	Human Values and Ethics	2-0-0	2
3.	IMIT-1201	Digital Electronics	3-0-0	3
4.	IMIT-1202	Data Structure	3-0-0	3
5.	IMIT-1203	ICT Workshop	0-0-4	2
6.	IMIT-1204	Object Oriented Programming	3-0-0	3
7.	IMIT-1205	OOPS Lab	0-0-4	2
8.	IMIT-1206	Digital Electronics Lab	0-0-2	1
9.	IMIT-1207	Data Structure Lab	0-0-2	1
Total Credits				21

Semester III				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMAS-2101	Mathematics – III*	3-1-0	4
2.	IMIT-2101	Bio-Medical Engineering	3-0-0	3
3.	IMIT-2102	Computer Networks	3-0-0	3
4.	IMHS-2101	Principles and Practices of Management	3-0-0	3
5.	IMIT-2103	Computer Organization & Architecture	3-0-0	3
6.	IMIT-2104	Database Management Systems	3-0-0	3
7.	IMIT-2105	Computer Networks Lab	0-0-2	1
8.	IMIT-2106	Computer Organization & Architecture Lab	0-0-2	1
9.	IMIT-2107	DBMS Lab	0-0-2	1
Total Credits				22

Semester IV				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMAS-2201	Mathematics – IV*	3-1-0	4
2.	IMIT-2201	Theory of Computation	3-0-0	3
3.	IMIT-2202	Software Engineering	3-0-0	3
4.	IMIT-2203	Design & Analysis of Algorithms	3-0-0	3
5.	IMIT-2204	Artificial Intelligence	3-0-0	3
6.	IMIT-2205	Operating Systems	3-0-0	3
7.	IMIT-2206	Design & Analysis of Algorithms Lab	0-0-2	1
8.	IMIT-2207	Operating Systems Lab	0-0-2	1
9.	IMIT-2208	Artificial Intelligence Programming Lab	0-0-2	1
10.	IMIT-2209	Software Engineering Lab	0-0-2	1
Total Credits				23

S.No.	Subject Code	Title of the course	Credits
1.	IMIT-2999	Internship	3
Total Credits			3

Internship: This will consist of 4 weeks training on AI simulation tools and techniques.

Semester V				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMIT-3101	Embedded System Design	3-0-0	3
2.	IMIT-3102	Computer Graphics	3-0-0	3
3.	IMAS-3101/IMHS-3101 ???	Business Analytics	3-0-0	3
4.	IMIT-3103	Information System Security	3-0-0	3
5.	IMIT-3104	Signals & Systems	3-0-0	3
6.		Elective 1 **	3-0-0	3
7.	IMIT-3105	Computer Graphics Lab	0-0-2	1
8.	IMIT-3106	Embedded System Design Lab	0-0-2	1
Total Credits				20

Semester VI				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMIT-3201	Cloud Computing	3-0-0	3
2.	IMIT-3202	Wireless Communication Technologies	3-0-0	3
3.	IMAS-3201	Modelling & Simulation	3-0-0	3
4.	IMMG-3201	Mini Project (Business Policy Design & Analysis)	0-0-4	2
5.		Elective 1**	3-0-0	3
6.		Elective 2**	3-0-0	3
7.	IMAS-3202	M&S Lab	0-0-2	1
8.	IMIT-3203	Cloud Computing Lab	0-0-2	1
9.	IMIT-3204	Wireless Communication Technologies Lab	0-0-2	1
Total Credits				20

S.No.	Subject Code	Title of the course	Credits
1.	IMIT-3999	B Tech Project (0-0-12)	6
		Total Credits	6

Semester VII				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMMG-4101	Business Statistics	3-0-0	3
2.	IMMG-4102	Managerial Economics	3-0-0	3
3.	IMMG-4103	Business and Legal Environment	3-0-0	3
4.	IMMG-4104	Financial Reporting & Management Accounting	3-0-0	3
5.	IMMG-4105	Organizational Behavior	3-0-0	3
6.	IMMG-4106	Internet Technologies for Business	3-0-0	3
7.	IMMG-4107	Business Communication	2-0-2	3
8.	IMMG-4108	Business Process Management	3-0-0	3
		Total Credits		24

Semester VIII				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMMG-4201	Human Resource Management	3-0-0	3
2.	IMMG-4202	Operations Management	3-0-0	3
3.	IMMG-4203	Marketing Management	3-0-0	3
4.	IMMG-4204	Decision Modeling	3-0-0	3
5.	IMMG-4205	Financial Management	3-0-0	3
6.	IMMG-4206	Decision Support and Expert System	3-0-0	3
7.	IMMG-4207	E-Governance	3-0-0	3
8.	IMMG-4208	Business Research Methods	3-0-0	3
		Total Credits		24

Summer Semester

S. No	Subject Code	Title of the course	Credits
1.	IMMG-4991	Online Learning Course-I	Audit
2.	IMMG-4992	Online Learning Course- II	Audit
3.	IMMG-4993	Colloquium based on Summer internship*	Audit

* **Summer Internship:** This will consist of internship of 8 weeks during summers(May-July).

Semester IX				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	IMMG-5101	Strategic Management	3-0-0	3
2.	IMMG-5102	Project Management	3-0-0	3
3.		Elective- I	3-0-0	3
4.		Elective- II	3-0-0	3
5.		Elective- III	3-0-0	3
6.		Elective- IV	3-0-0	3

7.		Elective- V	3-0-0	3
8.	IMMG-5199	Major Project Part-I	0-0-10	5
		Total Credits		26

Semester X				
S.No.	Subject Code	Title of the course	L.T-P	Credits
1.	IMMG-5299	Major Project Part-II	0-0-30	15
		Total Credits		15

* (While designing detailed course contents of mathematics I-IV, care to be taken that aspects of business mathematics/discrete math's/graph theory/probability & statistics etc. are also considered)

** Electives may be opted as per stream

Indicative List of Electives

The following is Focus area wise list of electives. The list is flexible in spirit and electives can be offered as per the needs of industry, academia and students.

1. Marketing Management

S. No	Subject code	Title of the course	L-T-P	Credits
1	IMMG-9101	Product and Brand Management	3-0-0	3
2	IMMG-9102	E-marketing	3-0-0	3
3	IMMG-9103	Service Marketing	3-0-0	3
4	IMMG-9104	Advertising and Sales Promotion Management	3-0-0	3
5	IMMG-9105	Sales and Distribution	3-0-0	3
6	IMMG-9106	Strategic Marketing	3-0-0	3
7	IMMG-9107	Marketing Research	3-0-0	3
8	IMMG-9108	Social Marketing	3-0-0	3
9	IMMG-9109	Customer Relationship Management	3-0-0	3
10	IMMG-9110	International Marketing	3-0-0	3
11	IMMG-9111	Emerging Areas in Marketing	3-0-0	3

2. Technology and Operations Management

S. No	Subject code	Title of the course	L-T-P	Credits
1	IMMG-9201	Supply Chain Management	3-0-0	3
2	IMMG-9202	Service Operations Management	3-0-0	3
3	IMMG-9203	New Product and Service Development	3-0-0	3
4	IMMG-9204	Business Systems Simulation	3-0-0	3
5	IMMG-9205	Retail Management	3-0-0	3
6	IMMG-9206	Total Quality Management	3-0-0	3
7	IMMG-9207	Technology Management	3-0-0	3

8	IMMG-9208	Manufacturing System Design	3-0-0	3
9	IMMG-9209	Technology and Operations Strategy	3-0-0	3
10	IMMG-9210	Emerging Areas in Technology and Operations Management	3-0-0	3
11	IMMG-9211	Empirical Research Methods in Operations Management	3-0-0	3
12	IMMG-9211	Lean Six Sigma Processes	3-0-0	3
13	IMMG-9212	Multi- Criterion Decision Making Models	3-0-0	3

3. IT and Systems

S. No	Subject code	Title of the course	L-T-P	Credits
1	IMMG-9301	Software Project Management	3-0-0	3
2	IMMG-9302	IT and Strategy	3-0-0	3
3	IMMG-9303	Knowledge Management	3-0-0	3
4	IMMG-9304	Software Engineering	3-0-0	3
5	IMMG-9305	Decision Support System	3-0-0	3
6	IMMG-9306	Software Quality Management	3-0-0	3
7	IMMG-9307	Telecommunications Systems Management	3-0-0	3
8	IMMG-9308	Strategic Planning of Information Systems	3-0-0	3
9	IMMG-9309	Emerging Areas in IT and Systems	3-0-0	3

4. Finance

S. No	Subject code	Title of the course	L-T-P	Credits
1	IMMG-9401	Security Analysis and Portfolio Management	3-0-0	3
2	IMMG-9402	Financial Risk management	3-0-0	3
3	IMMG-9403	Corporate Tax Planning	3-0-0	3
4	IMMG-9404	International Finance	3-0-0	3
5	IMMG-9405	Personal Wealth Management	3-0-0	3
6	IMMG-9406	Project Appraisal and Finance	3-0-0	3
7	IMMG-9407	Corporate Restructuring	3-0-0	3
8	IMMG-9408	Management of Financial Services	3-0-0	3
9	IMMG-9409	Economic and Financial Modeling	3-0-0	3
10	IMMG-9410	Emerging Areas in Finance	3-0-0	3
11	IMMG-9411	Management of Financial Institutions	3-0-0	3
12	IMMG-9412	Entrepreneurial Finance	3-0-0	3

5. Human Resource Management

S. No	Subject code	Title of the course	L-T-P	Credits
1	IMMG-9501	Change Management	3-0-0	3
2	IMMG-9502	Organization Theory and Development	3-0-0	3
3	IMMG-9503	Corporate Social Responsibility	3-0-0	3

4	IMMG-9504	Leadership and Talent Management	3-0-0	3
5	IMMG-9505	Competency Management	3-0-0	3
6	IMMG-9506	Training and Development	3-0-0	3
7	IMMG-9507	Management of Employee Relation	3-0-0	3
8	IMMG-9508	Labour Laws	3-0-0	3
9	IMMG-9509	Emerging Areas in Human Resource Management	3-0-0	3
10	IMMG-9510	Empirical Research Methods in HR	3-0-0	3

6. Management of Social Sector

S. No	Subject code	Title of the course	L-T-P	Credits
1	IMMG-9601	Infrastructure Management	3-0-0	3
2	IMMG-9602	Public Private Partnerships	3-0-0	3
3	IMMG-9603	Public Policy and Processes	3-0-0	3
4	IMMG-9604	Management of Rural and Social Sector	3-0-0	3
5	IMMG-9605	Sustainable Development	3-0-0	3
6	IMMG-9606	Management of Non Formal Organization	3-0-0	3
7	IMMG-9607	Information Technology Enabled Services	3-0-0	3
8	IMMG-9608	Healthcare System Management	3-0-0	3
9	IMMG-9609	Emerging Areas in Management of Social Sector	3-0-0	3

7. Business Analytics

Members have discussed about trimming the number of electives offered for Business Analytics. The trimming of number of electives is under process and yet to be arrived at.

S. No	Subject code	Title of the course	L-T-P	Credits
1.	IMMG-9701	Accounting Analytics	3-0-0	3
2.	IMMG-9702	Business Analytics and Consulting	3-0-0	3
3.	IMMG-9703	Energy Analytics and Modeling	3-0-0	3
4.	IMMG-9704	Financial Analytics and Modeling	3-0-0	3
5.	IMMG-9705	Health Care Analytics	3-0-0	3
6.	IMMG-976	Marketing Analytics and Research	3-0-0	3
7.	IMMG-9707	Multivariate Analysis	3-0-0	3
8.	IMMG-9708	Supply Chain Analytics	3-0-0	3
9.	IMMG-9709	Logistics Analytics	3-0-0	3
10.	IMMG-9710	Organizational Analytics and Research	3-0-0	3
11.	IMMG-9711	Behavioral Analytics	3-0-0	3
12.	IMMG-9712	HR Analytics	3-0-0	3

13.	IMMG-9713	Operations Analytics	3-0-0	3
14.	IMMG-9714	ERP Systems and Business Integration Analytics	3-0-0	3
15.	IMMG-9715	Data Mining with R	3-0-0	3
16.	IMMG-9716	Analytical Consulting for Financial Services	3-0-0	3
17.	IMMG-9717	Social Media and Network Analysis	3-0-0	3
18.	IMMG-9718	Text Analytics for Business	3-0-0	3
19.	IMMG-9719	Big Data Management and Analytics	3-0-0	3
20.	IMMG-9720	Artificial Intelligence	3-0-0	3
21.	IMMG-9721	Data Mining: Algorithms and Applications	3-0-0	3
22.	IMMG-9722	Analytical Design Thinking	3-0-0	3

APPENDIX E: New Proposed Course Structure: PG MBA

Name of the programme – MBA

Programme Philosophy

The demands of a global economy have changed the necessities for individual and business success. As a result, the MBA Programme at ABV-IIITM, Gwalior is leading to an industry redefinition of traditional business education. Leveraging its educational profundity, global network of business connections, and a diverse, supportive culture, this programme delivers a unique leadership and management educational experience.

The programme offers an array of opportunities for education, personal and career development, community involvement, and social interaction. In this programme, traditional management education is complemented with high-impact, hands-on professional development. The viability of programme demonstrates suitable combination of knowledge with actions, and output driven orientation so as to cater the corporate and societal readiness.

Expected competencies from students

1. Demonstrate the relevance of satisfying experience to professional accomplishments.
2. Enhance the leadership and collaborative ability of individuals in teams and organizations.
3. Explore how trends in the global economy influence the corporate strategies.
4. Translate ethical values into business practice.
5. Demonstrate proficiency in the business verticals to gain competitive advantage.
6. Tracking and developing career and professional competencies.

Total credits: 104

Breakup of the credits category wise

Category	No. of courses	Credits
Management Core Courses	23	69
Management Electives	9	27
Mini/Major Projects	2	8
Seminar/colloquium/Internship	1	Audit
Total	35	104

Breakup of the credits semester wise

Semester	No of courses	Credits
I	8	24
II	8	24
III	8	28
IV	8	28
Total		104

PG MBA PROGRAMME COURSE CURRICULUM

Semester I				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	MBMG-6101	Principles and Practices of Management	3-0-0	3
2.	MBMG-6102	Business Statistics	3-0-0	3
3.	MBMG-6103	Managerial Economics	3-0-0	3
4.	MBMG-6104	Business and Legal Environment	3-0-0	3
5.	MBMG-6105	Financial Reporting & Management Accounting	3-0-0	3
6.	MBMG-6106	Organizational Behavior	3-0-0	3
7.	MBMG-6107	Internet Technologies for Business	3-0-0	3
8.	MBMG-6108	Business Communication	2-0-2	3
Total Credits				24

Semester II				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	MBMG-6201	Human Resource Management	3-0-0	3
2.	MBMG-6202	Operations Management	3-0-0	3
3.	MBMG-6203	Marketing Management	3-0-0	3
4.	MBMG-6204	Decision Modeling	3-0-0	3
5.	MBMG-6205	Financial Management	3-0-0	3
6.	MBMG-6206	Decision Support and Expert System	3-0-0	3
7.	MBMG-6207	E-Governance	3-0-0	3
8.	MBMG-6208	Business Research Methods	3-0-0	3
Total Credits				24

Summer Semester

S. No	Subject Code	Title of the course	Credits
1	MBMG-6991	Online Learning Course-I	Audit
2	MBMG-6992	Online Learning Course- II	Audit
3	MBMG-6993	Colloquium based on Summer internship*	Audit

* **Summer Internship:** This will consist of internship of 8 weeks during summers.

Semester III				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	MBMG-7101	Strategic Management	3-0-0	3
2.	MBMG-7102	Project Management	3-0-0	3
3.	MBMG-7103	Business Process Management	3-0-0	3
4.	MBMG-7104	Business Analytics	3-0-0	3
5.		Elective- I	3-0-0	3
6.		Elective- II	3-0-0	3
7.		Elective- III	3-0-0	3
8.		Elective- IV	3-0-0	3
9.	MBMG-7199	Major Project Part-I	0-0-8	4
Total Credits				28

Semester IV				
S.No.	Subject Code	Title of the course	L-T-P	Credits
1.	MBMG-7201	Business Ethics	3-0-0	3
2.	MBMG-7202	Entrepreneurship and Innovation	3-0-0	3
3.	MBMG-7203	International Business	3-0-0	3
4.		Elective- V	3-0-0	3
5.		Elective- VI	3-0-0	3
6.		Elective- VII	3-0-0	3
7.		Elective- VIII	3-0-0	3
8.		Elective- IX	3-0-0	3
9.	MBMG-7299	Major Project Part-II	0-0-8	4
		Total Credits		28

Indicative List of Electives

The following is Focus area wise list of electives. The list is flexible in spirit and electives can be offered as per the needs of industry, academia and students.

1. Marketing Management

S. No	Subject Code	Title of the course	L-T-P	Credits
1	MBMG-9101	Product and Brand Management	3-0-0	3
2	MBMG-9102	E-marketing	3-0-0	3
3	MBMG-9103	Service Marketing	3-0-0	3
4	MBMG-9104	Advertising and Sales Promotion Management	3-0-0	3
5	MBMG-9105	Sales and Distribution	3-0-0	3
6	MBMG-9106	Strategic Marketing	3-0-0	3
7	MBMG-9107	Marketing Research	3-0-0	3
8	MBMG-9108	Social Marketing	3-0-0	3
9	MBMG-9109	Customer Relationship Management	3-0-0	3
10	MBMG-9110	International Marketing	3-0-0	3
11	MBMG-9111	Emerging Areas in Marketing	3-0-0	3

2. Technology and Operations Management

S. No	Subject Code	Title of the course	L-T-P	Credits
1	MBMG-9201	Supply Chain Management	3-0-0	3
2	MBMG-9202	Service Operations Management	3-0-0	3
3	MBMG-9203	New Product and Service Development	3-0-0	3
4	MBMG-9204	Business Systems Simulation	3-0-0	3
5	MBMG-9205	Retail Management	3-0-0	3
6	MBMG-9206	Total Quality Management	3-0-0	3
7	MBMG-9207	Technology Management	3-0-0	3
8	MBMG-9208	Manufacturing System Design	3-0-0	3
9	MBMG-9209	Technology and Operations Strategy	3-0-0	3
10	MBMG-9210	Emerging Areas in Technology and Operations Management	3-0-0	3
11	MBMG-9211	Empirical Research Methods in Operations Management	3-0-0	3

12	MBMG-9212	Lean Six Sigma Processes	3-0-0	3
13	MBMG-9213	Multi- Criterion Decision Making Models	3-0-0	3

3. IT and Systems

S. No	Subject Code	Title of the course	L-T-P	Credits
1	MBMG-9301	Software Project Management	3-0-0	3
2	MBMG-9302	IT and Strategy	3-0-0	3
3	MBMG-9303	Knowledge Management	3-0-0	3
4	MBMG-9304	Software Engineering	3-0-0	3
5	MBMG-9305	Decision Support System	3-0-0	3
6	MBMG-9306	Software Quality Management	3-0-0	3
7	MBMG-9307	Telecommunications Systems Management	3-0-0	3
8	MBMG-9308	Strategic Planning of Information Systems	3-0-0	3
9	MBMG-9309	Emerging Areas in IT and Systems	3-0-0	3

4. Finance

S. No	Subject Code	Title of the course	L-T-P	Credits
1	MBMG-9401	Security Analysis and Portfolio Management	3-0-0	3
2	MBMG-9402	Financial Risk management	3-0-0	3
3	MBMG-9403	Corporate Tax Planning	3-0-0	3
4	MBMG-9404	International Finance	3-0-0	3
5	MBMG-9405	Personal Wealth Management	3-0-0	3
6	MBMG-9406	Project Appraisal and Finance	3-0-0	3
7	MBMG-9407	Corporate Restructuring	3-0-0	3
8	MBMG-9408	Management of Financial Services	3-0-0	3
9	MBMG-9409	Economic and Financial Modeling	3-0-0	3
10	MBMG-9410	Emerging Areas in Finance	3-0-0	3
11	MBMG-9411	Management of Financial Institutions	3-0-0	3
12	MBMG-9412	Entrepreneurial Finance	3-0-0	3

5. Human Resource Management

S. No	Subject Code	Title of the course	L-T-P	Credits
1	MBMG-9501	Change Management	3-0-0	3
2	MBMG-9502	Organization Theory and Development	3-0-0	3
3	MBMG-9503	Corporate Social Responsibility	3-0-0	3
4	MBMG-9504	Leadership and Talent Management	3-0-0	3
5	MBMG-9505	Competency Management	3-0-0	3
6	MBMG-9506	Training and Development	3-0-0	3
7	MBMG-9507	Management of Employee Relation	3-0-0	3
8	MBMG-9508	Labour Laws	3-0-0	3
9	MBMG-9509	Emerging Areas in Human Resource Management	3-0-0	3
10	MBMG-9510	Empirical Research Methods in HR	3-0-0	3

6. Management of Social Sector

S. No	Subject Code	Title of the course	L-T-P	Credits
1	MBMG-9601	Infrastructure Management	3-0-0	3
2	MBMG-9602	Public Private Partnerships	3-0-0	3
3	MBMG-9603	Public Policy and Processes	3-0-0	3
4	MBMG-9604	Management of Rural and Social Sector	3-0-0	3
5	MBMG-9605	Sustainable Development	3-0-0	3
6	MBMG-9606	Management of Non Formal Organization	3-0-0	3
7	MBMG-9607	Information Technology Enabled Services	3-0-0	3
8	MBMG-9608	Healthcare System Management	3-0-0	3
9	MBMG-9609	Emerging Areas in Management of Social Sector	3-0-0	3

7. Business Analytics

Members have discussed about trimming the number of electives offered for Business Analytics. The trimming of number of electives is under process and yet to be arrived at.

S. No	Subject Code	Title of the course	L-T-P	Credits
1.	MBMG-9701	Accounting Analytics	3-0-0	3
2.	MBMG-9702	Business Analytics and Consulting	3-0-0	3
3.	MBMG-9703	Energy Analytics and Modeling	3-0-0	3
4.	MBMG-9704	Financial Analytics and Modeling	3-0-0	3
5.	MBMG-9705	Health Care Analytics	3-0-0	3
6.	MBMG-9706	Marketing Analytics and Research	3-0-0	3
7.	MBMG-9707	Multivariate Analysis	3-0-0	3
8.	MBMG-9708	Supply Chain Analytics	3-0-0	3
9.	MBMG-9709	Logistics Analytics	3-0-0	3
10.	MBMG-9710	Organizational Analytics and Research	3-0-0	3
11.	MBMG-9711	Behavioral Analytics	3-0-0	3
12.	MBMG-9712	HR Analytics	3-0-0	3
13.	MBMG-9713	Operations Analytics	3-0-0	3
14.	MBMG-9714	ERP Systems and Business Integration Analytics	3-0-0	3
15.	MBMG-9715	Data Mining with R	3-0-0	3
16.	MBMG-9716	Analytical Consulting for Financial Services	3-0-0	3
17.	MBMG-9717	Social Media and Network Analysis	3-0-0	3
18.	MBMG-9718	Text Analytics for Business	3-0-0	3
19.	MBMG-9719	Big Data Management and Analytics	3-0-0	3
20.	MBMG-9720	Artificial Intelligence	3-0-0	3
21.	MBMG-9721	Data Mining: Algorithms and Applications	3-0-0	3
22.	MBMG-9722	Analytical Design Thinking	3-0-0	3

APPENDIX F: Programmewise Committees for Curriculum Revision

27 Oct 2017

Curriculum revision exercise is undertaken with a view to make our curriculum contemporary and relevant. The following committees are formed for various programmes

B Tech CS

Dr J Dhar (chairperson)

- Dr Neetesh Kumar(member)
 - Dr Pankaj Srivasatava(member)
 - Dr Vishal Vyas(member)
 - Prof Anupam Shukla (member)
 - Prof S Tapaswi (member)
- Dr Anuraj Singh (convener)

IPG M Tech

- Prof Anupam Shukla(chairperson)
- Prof S Tapaswi (member)
- Prof A Trivedi (member)
- Dr Mahua Bhattacharya(member)
- Dr Gyan Prakash (member)
- Dr Pankaj Srivastava(member)
- Dr Ajay Kumar (member)
- Dr Neetesh Kumar(convener)

IPG MBA

- Prof R Sahu (chairperson)
- Dr Gyan Prakash (member)
- Prof Anupam (member)
- Prof A Trivedi (member)
- Dr K K Pattanaik (member)
- Dr Anuraj Singh(member)
- Dr Vinay Singh (member)
- Dr Yash Daultani (convener)

M. Tech

VLSI & Embedded Systems

Dr Manisha (chairperson)

- Dr Pankaj Srivasatva (member)
- Dr Anurag Srivastava (member)

- Dr Saumya Bhadauria (member)
Dr Gaurav Kaushal (convener)

Digital Communications

- Prof A Trivedi (chairperson)
- Dr Mahua Bhattacharya(member)
 - Dr PK Singh (member)
 - Dr KK Pattanik (member)
Dr Wilfred (convener)

Computer Networks

- Dr PK Singh (chairperson)
- Dr Ritu Tiwari(member)
 - Dr Wilfred (member)
 - Prof Anupam Shukla(member)
Dr Saumya Bhadauria (convener)

Information Security

- Prof S Tapaswi (chairperson)
- Dr Neetesh (member)
 - Dr Ritu Tiwari(member)
 - Dr Anuraj Singh (member)
Dr KK Patanaik (Convener)

MBA (all streams)

- Prof R Sahu (chairperson)
- Dr Gyan Prakash (member)
- Dr Manoj Patwardhan (member)
- Dr N Bajpai (member)
- Dr Gaurav Agrawal(member)
- Dr VinaySingh (member)
- Dr Manoj Dash (member)
- Dr J Dhar (member)
- Dr Yash Daultani (member)
- Dr Vishal Vyas (Convener)