

Course Structure

Integrated MTech. (5 Year Programme)

BTech. In Information Technology

+

M.Tech. in Information Technology

For batch 2023 onward

**ABV-Indian Institute of Information Technology & Management,
Gwalior**

5 year (10 Semester) Integrated M.Tech. Programme (Total credits: 213)

SEMESTER -1	Sl no	Course Code	Subjects	Credits	L-T-P
	1	EE101	Fundamentals of Electrical and Electronics	4	3-0-2
	2	PH101	Engineering Physics	4	3-0-2
	3	MA101	Engineering Mathematics	4	3-1-0
	4	EE102	Engineering Design Principles	3	2-0-2
	5	IT101	Principles of Computer Programming	4	3-0-2
	6	HS101	Freshman Skills	2	2-0-0
	7	HS102	Sports and Physical Education	2	0-1-2
			Total	23 Credits	

SEMESTER -2	Sl no	Course Code	Subjects	Credits	L-T-P
	1	EE103	Digital Electronics	4	3-0-2
	2	MA102	Probability and Statistics	4	3-1-0
	3	IT102	Data Structures	4	3-0-2
	4	EE104	Hardware Workshop	3	1-0-4
	5	IT103	Object Oriented Programming	4	3-0-2
	6	HS103	Ecology and Environment Sciences	2	2-0-0
	7	CS104	Mobile Application Technologies	2	0-1-2
			Total	23 Credits	
	MO101	MOOC-1 (Optional in summer)		2/3-0-0	

EXIT AFTER YEAR - 1

Certificate in Engineering Sciences (46 credits)

SEMESTER -3	Sl no	Course Code	Subjects	Credits	L-T-P
	1	HS201	Indian Culture, Ethics and Moral Values	2	2-0-0
	2	IT201	Discrete Structures	4	3-1-0
	3	IT202	Computer Organization and Architecture	4	3-0-2
	4	IT203	Design and Analysis of Algorithms	4	3-0-2
	5	IT204	Data Communications	4	3-0-2
	6	IT205	Database Systems	4	3-0-2
			Total	22 credits	

SEMESTER -4	Sl no	Course Code	Subjects	Credits	L-T-P
	1	MS201	Entrepreneurship and Innovation	2	2-0-0
	2	IT206	Theory of Computation	3	3-0-0
	3	IT207	Operating Systems	4	3-0-2
	4	IT208	Computer Networks	4	3-0-2
	5	EE207	Signals and Systems	4	3-1-0
	6	IT209	Graph Theory	4	3-0-2
			Total	21 credits	
	MO201	MOOC-2 (Optional in summer)		2/3-0-0	

EXIT AFTER YEAR - 2

Diploma in Information Technology (89 credits)

SEMESTER -5	Sl no	Course Code	Subjects	Credits	L-T-P
	1	MS301	Business Economics	3	3-0-0
	2		Multidisciplinary/Open Elective- 1	3	3-0-0
	3	EE303	Microprocessor and Interfacing	4	3-0-2
	4	IT302	Compiler Design	4	3-0-2
	5	IT303	Computer Graphics	4	3-0-2
	6	IT304	Trustworthy Artificial Intelligence	4	3-0-2
			Total	22 credits	

SEMESTER -6	Sl no	Course Code	Subjects	Credits	L-T-P
	1	ENXXX	Art of Engineering Research	2	2-0-0
	2		Multidisciplinary/Open Elective- 2/MOOC 1 ^s	3	3-0-0
	3	IT0XX	Department Elective-1	3	3-0-0
	4	IT305	Optimization Techniques	4	3-1-0
	5	IT306	Machine Learning	4	3-0-2
	6	IT307	Wireless Communication Technologies	4	3-0-2
			Total	20 credits	

BTech Project allocation to be done during 6th Semester

^s MOOC 1 can also be taken in summer after 2nd semester if the student wishes to finish it earlier.

EXIT AFTER YEAR - 3

BSc in Information Technology (131 credits)

SEMESTER -7	Sl no	Course Code	Subjects	Credits	L-T-P
	1		Multidisciplinary/Open Elective- 3/MOOC 2 ^s	3	3-0-0
	2	IT0XX	Department Elective -2	3	3-0-0
	3	EE405	Integrated Circuit Design	4	3-0-2
	4	IT401	Cloud Computing	4	3-0-2
	5	IT402	Digital Image Processing	4	3-0-2
	6	IT403	Cryptography	3	3-0-0
	7	IT399	BTech Summer Project	6	0-0-12
			Total	27 credits	

^s MOOC 2 can also be taken in summer after 4th semester if the student wishes to finish it earlier

SEMESTER -8	Sl no	Course Code	Subjects	Credits	L-T-P
	1	IT404	Software Engineering	4	3-0-2
	2	IT405	Data Mining	4	3-0-2
	3.	IT406	IoT and Applications	4	3-0-2
	4.	IT407	Mobile Computing	3	3-0-0
	5.	IT0XX	Department Elective – 3	3	3-0-0
	6		Multidisciplinary/Open Elective- 4/MOOC 3	3	3-0-0
			Total	21 credits	


Colloquium of 3 credits in summer semester (MOOC, NPTEL etc. in place of colloquium)

EXIT AFTER YEAR - 4

BTech^s/BSc (Hons.)[#] in Information Technology (179 credits)

SEMESTER -9	Sl no	Course Code	Course	Credits	L-T-P
	1.	IT501	Natural Language Processing	4	3-0-2
	3.	IT498	Colloquium	3	0-0-6
	4.	IT598	MTech Thesis – Part 1	12	0-0-24
	Total			19 credits	

SEMESTER -10	Sl no	Course Code	Course	Credits	L-T-P
	1.	IT0XX	Department Elective – 4/MOOC 4	3	3-0-0
	2.	IT599	MTech Thesis – Part 2	12	0-0-24
	Total			15 credits	


BTech. + MTech. in Information Technology (213 credits)

		Total credits for IPG MTech. Programme	213
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NOTE-1:

[§] **BTech. in Information Technology:** If a candidate opts for an early exit after 4th year in the beginning of 3rd year or termed as Planned Exit. In such a case the course structure is different from the above. Please refer to the course structure of BTech. In Information Technology.

[#] **BSc (Honours) in Information Technology:** If a candidate opts for an abrupt exit after 4th year without exercising an option for exit in the beginning of 3rd year or termed as Abrupt Exit. In such a case the student exits with BSc. In Information Technology.

NOTE-2:

A candidate from IT can receive a Minor Degree in CSE/EEE/Mathematics & Scientific Computing if he/she earns the prescribed credits (Over and above) the credits prescribed by the respective major programme.

Minor in Information Technology

Sl no	Code	Courses	Credits	L-T-P
1	IT207	Operating System	4	3-0-2
2	IT208	Computer Networks	4	3-0-2
3	IT404	Software Engineering	4	3-0-2
4	IT205	Database Systems	4	3-0-2
5	IT401	Cloud Computing	4	3-0-2
6	IT0XX	IT Elective Courses	3	3-0-0
Total			23 Credits	

NOTE-3: A Minor in Information Technology is open to student(s) from other discipline subject to successful completion of the above credits with a minimum of 6 CGPA. A student can opt for the courses depending on the convenience. For example: IT207 and IT208 are offered in 4th semester. A student can opt for these courses along with his regular courses in 4th semester OR he can take one of the two courses in 4th semester and the other in his 6th semester. This reduces the credit load in a particular semester. In addition, if a given course is floated in summer semester, the student can also opt for the same in summer semester.

Course Structure

BTech. In Information Technology (Early Exit)

(For Batch 2023 onward)

**ABV-Indian Institute of Information Technology & Management,
Gwalior**

4 year (8 semester) B.Tech. in Information Technology (Total credits: 170)

SEMESTER -1	Sl no	Course Code	Subjects	Credits	L-T-P
	1	EE101	Fundamentals of Electrical and Electronics	4	3-0-2
	2	PH101	Engineering Physics	4	3-0-2
	3	MA101	Engineering Mathematics	4	3-1-0
	4	EE102	Engineering Design Principles	3	2-0-2
	5	IT101	Principles of Computer Programming	4	3-0-2
	6	HS101	Freshman Skills	2	2-0-0
	7	HS102	Sports and Physical Education	2	0-1-2
			Total	23 Credits	

SEMESTER -2	Sl no	Course Code	Subjects	Credits	L-T-P
	1	EE103	Digital Electronics	4	3-0-2
	2	MA102	Probability and Statistics	4	3-1-0
	3	IT102	Data Structures	4	3-0-2
	4	EE104	Hardware Workshop	3	1-0-4
	5	IT103	Object Oriented Programming	4	3-0-2
	6	HS103	Ecology and Environment Sciences	2	2-0-0
	7	CS104	Mobile Application Technologies	2	0-1-2
			Total	23 credits	
	MO101	MOOC-1 (Optional in summer)	2/3-0-0		

EXIT AFTER YEAR - 1

Certificate in Engineering Sciences (46 credits)

SEMESTER -3	Sl no	Course Code	Subjects	Credits	L-T-P
	1	HS201	Indian Culture, Ethics and Moral Values	2	2-0-0
	2	IT201	Discrete Structures	4	3-1-0
	3	IT202	Computer Organization and Architecture	4	3-0-2
	4	IT203	Design and Analysis of Algorithms	4	3-0-2
	5	IT204	Data Communications	4	3-0-2
	6	IT205	Database Systems	4	3-0-2
			Total	22 credits	

SEMESTER -4	Sl no	Course Code	Subjects	Credits	L-T-P
	1	HS202	Entrepreneurship and Innovation	2	2-0-0
	2	IT206	Theory of Computation	3	3-0-0
	3	IT207	Operating Systems	4	3-0-2
	4	IT208	Computer Networks	4	3-0-2
	5	EE207	Signals and Systems	4	3-1-0
	6	IT209	Graph Theory	4	3-0-2
			Total	21 credits	
	MO201	MOOC-2 (Optional in summer)	2/3-0-0		

EXIT AFTER YEAR - 2

Diploma in Information Technology (89 credits)

SEMESTER -5	Sl no	Course Code	Subjects	Credits	L-T-P
	1	MS301	Business Economics	3	3-0-0
	2		Multidisciplinary/Open Elective- 1	3	3-0-0
	3	EE303	Microprocessor and Interfacing	4	3-0-2
	4	IT302	Compiler Design	4	3-0-2
	5	IT303	Computer Graphics	4	3-0-2
	6	IT304	Trustworthy Artificial Intelligence	4	3-0-2
		Total	22 credits		

SEMESTER -6	Sl no	Course Code	Subjects	Credits	L-T-P
	1	EN	Art of Engineering Research	2	2-0-0
	2		Multidisciplinary/Open Elective- 2/MOOC 1 ^s	3	3-0-0
	3	IT0XX	Department Elective-1	3	3-0-0
	4	IT305	Optimization Techniques	4	3-1-0
	5	IT306	Machine Learning	4	3-0-2
	6	IT307	Wireless Communication Technologies	4	3-0-2
		Total	20 credits		

Colloquium of 2 credits in summer semester (MOOC, NPTEL etc. in lieu of colloquium)

^s MOOC 1 can also be taken in summer after 2nd semester if the student wishes to finish it earlier.

EXIT AFTER YEAR - 3

BSc in Information Technology (131 credits)

SEMESTER -7	Sl no	Course Code	Subjects	Credits	L-T-P
	1		Multidisciplinary/Open Elective- 3/MOOC 2	3	3-0-0
	2	IT0XX	Department Elective -2	3	3-0-0
	3	EE405	Integrated Circuit Design	4	3-0-2
	4	IT401	Cloud Computing	4	3-0-2
	5	IT402	Digital Image Processing	4	3-0-2
	6	IT403	Cryptography	3	3-0-0
	7	IT399	Colloquium (Based on industrial training)/MOOC 3	3	0-0-6/ 3-0-0
		Total	24 credits		

^s MOOC 2 can also be taken in summer after 4th semester if the student wishes to finish it earlier

SEMESTER - 8	Sl no	Course Code	Subjects	Credits	L-T-P
	1	IT404	BTech Project/Internship	12	0-0-24
	2	IT0XX	Department Elective – 3/MOOC 4	3	3-0-0
		Total	15 credits		

FINAL EXIT AFTER YEAR - 4

BTech. in Information Technology (170 credits)

IPG Electives courses

1. Visual Information Processing

Sl.No	Course Name	Course Code	L-T-P	Credits
1	Computer Vision	IT001	3-0-0	3
2	Digital Signal Processing	IT002	3-0-0	3
3	Pattern Recognition	IT003	3-0-0	3
4	Information Retrieval and Extraction.	IT004	3-0-0	3
5	Human Computer Interaction	IT005	3-0-0	3
6	Digital Video Processing	IT006	3-0-0	3
7	Advanced Machine Learning	IT007	3-0-0	3
8	Multimedia Processing	IT008	3-0-0	3
9	Digital Watermarking	IT009	3-0-0	3
10	Applied Image Processing	IT010	3-0-0	3

2. Communication and Networks

Sl.No	Course Name	Course Code	L-T-P	Credits
1	Cognitive Radio	IT011	3-0-0	3
2	Next Generation Networks	IT012	3-0-0	3
3	Queuing Theory	IT013	3-0-0	3
4	Network design and Optimization	IT014	3-0-0	3
5	Advanced Wireless Communications	IT015	3-0-0	3
6	Multimedia Networks	IT016	3-0-0	3
7	Industrial IoT Communication	IT017	3-0-0	3
8	Detection and Estimation Theory	IT018	3-0-0	3
9	Distributed Systems	IT019	3-0-0	3
10	Information Theory and Coding	IT020	3-0-0	3
11	Convex Optimization	IT021	3-0-0	3

3. Information Security

Sl.No	Course Name	Course Code	L-T-P	Credits
1	Digital Watermarking and Steganalysis	IT022	3-0-0	3
2	Cryptography and Network Security	IT023	3-0-0	3
3	Distributed System Security	IT024	3-0-0	3
4	Cyber Security and Laws	IT025	3-0-0	3
5	Advanced cryptography	IT026	3-0-0	3
6	Information Security and Secure Coding	IT027	3-0-0	3
8	Malware Analysis	IT028	3-0-0	3
9	Formal methods for Security Verifications	IT029	3-0-0	3
10	IoT and its security	IT030	3-0-0	3
11	Blockchain Technologies	IT031	3-0-0	3

4. Computing and Data Sciences

Sl.No	Course Name	Course Code	L-T-P	Credits
1	Convex Optimization	IT032	3-0-0	3
2	Parallel and Concurrent Programming	IT033	3-0-0	3
3	Scientific Computing and Numerical Methods	IT034	3-0-0	3
4	Game Theory	IT035	3-0-0	3
5	Big Data Analytics	IT036	3-0-0	3
6	Nature Inspired computing	IT036	3-0-0	3
7	Deep Learning	IT037	3-0-0	3
8	Program Analysis Verification and Testing	IT038	3-0-0	3
9	Competitive Programming	IT039	3-0-0	3