BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study
B.Tech. in Information Technology

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C- Credits*
					L *(Periods/week)*	**T** *(Periods/week)*	**P** *(Periods/week)*	**C**
GRAND TOTAL FOR FIRST YEAR								**43.5**
				THEORY				
THIRD Monsoon	FIRST	FS	BE101	Biological Science for Engineers	2	0	0	2
	SECOND	GE	IT 201	Basics of Intelligent Computing	3	0	0	3
	THIRD	PC	MA205	Discrete Mathematics	3	1	0	4
	SECOND		EC203	Digital System Design	3	0	0	3
			CS201	Data Structures	3	1	0	4
				LABORATORIES				
	FIRST	GE	EE102	Electrical Engineering lab	0	0	3	1.5
	SECOND	MC	MC201/202/203/204	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
		PC	EC204	Digital System Design Lab	0	0	3	1.5
			CS202	Data Structures Lab	0	0	3	1.5
TOTAL								**21.5**
				THEORY				
FOURTH Spring	SECOND	FS	MA203	Numerical Methods	2	0	0	2
	FIRST	FS	CE101	Environmental Science	2	0	0	2
	SECOND	PC	CS203	Computer Organization Architecture	3	1	0	4
			CS204	Object Oriented Programming and Design Pattern	3	0	0	3
			CS206	Design and Analysis of Algorithm	3	0	0	3
			CS303	Operating System	3	0	0	3
				LABORATORIES				
	SECOND	FS	MA204	Numerical Methods Lab	0	0	2	1
		GE	IT202	Basic IT Workshop (Common Subject)	0	0	2	1
		MC	MC205/206/207/208	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
		PC	CS205	OOPDP Lab	0	0	3	1.5
			CS304	OS Lab	0	0	3	1.5
			CS207	Design of Algorithm Lab	0	0	3	1.5
TOTAL								**24.5**
FIFTH Monsoon	THIRD	PC	IT301	Data Comm. Computer Network	3	1	0	4
			CS301	Database Management System	3	0	0	3
			CS208	Formal Language and Automata Theory	3	0	0	3
			IT303	Internet & Web Technology	3	0	0	3
		PE	**	PROGRAM ELECTIVE-I	3	0	0	3
		OE	*	OPEN ELECTIVE-I	3	0	0	3
				LABORATORIES				
		PC	IT302	DCCN Lab	0	0	3	1.5
			CS302	DBMS Lab	0	0	3	1.5
			IT220	Shell and Kernel Programming	0	0	3	1.5
			IT304	Internet & Web Technology Lab	0	0	3	1.5
TOTAL								**25**
SIXTH Spring	THIRD	PC	IT305	Software Engineering	3	0	0	3
			IT307	Image Processing	3	0	0	3
		PE	**	PROGRAM ELECTIVE-II	3	0	0	3
		OE	*	OPEN ELECTIVE-II	3	0	0	3
	FIRST	HSS	MT123	Business Communications	3	0	0	3
	THIRD	MC	MC300	Summer training - Mandatory				3
	SECOND	HSS	MT204	Constitution of India	2	0	0	Non-credit
				LABORATORIES				
	THIRD	PC	IT306	Software Engineering Lab	0	0	3	1.5
			CS308	Mobile Interface Lab	0	0	3	1.5
			IT308	Image Processing Lab	0	0	3	1.5
		PE	**	PROGRAM ELECTIVE LAB-I	0	0	3	1.5
TOTAL								**24**
SEVENTH Monsoon	FOURTH	PC	IT404	Professional Practice Law & Ethics	2	0	0	2
		PE	**	PROGRAM ELECTIVE-III	3	1	0	4
		OE	*	OPEN ELECTIVE-III/ MOOC-I	3	0	0	3
		PE	**	PROGRAM ELECTIVE-IV	3	0	0	3
		OE	*	OPEN ELECTIVE-IV/MOOC-II	3	0	0	3
				LABORATORIES				
		PE	**	PROGRAM ELECTIVE LAB-II	0	0	3	1.5
TOTAL								**16.5**

EIGTH Spring	FOURTH	PC	IT400	Research project / Industry Internship	NOT APPLICABLE	12
GRAND TOTAL						**167**
Programme Elective and Open Elective may include one or two Massive Open Online Course (MOOC)						

** indicates program elective (PE)
* indicates Open Elective (OE)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
PROGRAMME ELECTIVES (PE)*
OFFERED FOR LEVEL 1-4

PE / LEVEL		Code no.	Name of the PE Courses	Prerequisites/ Corequisites Courses with code	L	T	P	C
3		IT320	UI Design	OOPDP CS204	3	0	0	3
3		IT321	Bio Inspired Computing	Data Structure CS201	3	0	0	3
3		CS320	Optimization Technique	Design and Analysis of Algorithm CS206	3	0	0	3
3		IT321	Soft Computing	Discrete Mathematics MA303	3	0	0	3
3		CS322	Simulation and Modelling	Data Structure CS201, Mathematics-II MA 107	3	1	0	4
3		CS323	Simulation Modelling Lab	Simulation Modelling CS322	0	0	3	1.5
3	PE 1	IT322	Cloud Computing	Basics of Intelligent Computing IT 201	3	0	0	3
3		IT323	Software Project Management	Software Engineering IT305	3	0	0	3
3		CS324	System Programming	NIL	3	0	0	3
3		CS325	Database Modelling	Database Management System CS301	3	0	0	3
3		CS326	Database Modelling Lab	Database Modelling CS325	0	0	3	1.5
3		IT324	Software Testing	Software Engineering IT305	3	1	0	4
3		IT325	Software Testing Lab	Software Testing IT324	0	0	3	1.5
3		IT326	Wireless Sensor Network	Data communication and Computer networks IT301	3	0	0	3
3		IT327	Wireless Sensor Lab	Wireless Sensor Network IT326	0	0	3	1.5
3		IT328	Pattern Recognition	Image Processing IT307	3	1	0	4
3		IT329	Pattern Recognition Lab	Pattern Recognition IT328	0	0	3	1.5
3	PE 2	CS327	Computer Graphics	Design and Analysis of Algorithm CS206	3	0	0	3
3		CS328	Computer Graphics Lab	Computer Graphics CS327	3	0	0	3
3		IT330	Cryptography & Network Security	Mathematics-I MA 103/Mathematics-II MA 107	3	0	0	3
3		CS391	Introduction to Distributed System	NIL	3	0	0	3
4		IT401	Data Analysis and Interpretation	NIL	3	0	0	3
4		IT420	Artificial Intelligence	Basics of Intelligent Computing IT 201	3	0	0	3
4		IT421	Artificial Intelligence Lab	Artificial Intelligence IT420	0	0	3	1.5
4		IT422	Principles of Multimedia	NIL	3	0	0	3
4		IT423	Internet of Things(IoT)	Basics Of intelligent Computing IT 201	3	1	0	4
4		IT424	Internet of Things(IoT) Lab	Internet of Things(IoT) IT423	0	0	3	1.5
4		CS420	Advanced Data Structure	Data Structure CS201	3	0	0	3
4		CS421	Parallel Computing	Design and Analysis of Algorithm CS206	3	0	0	3
4	PE 3	CS422	Parallel Computing Lab	Parallel Computing CS421	0	0	3	1.5
4		IT425	Image Analysis	Image Processing IT307	3	0	0	3

		Code	Course	Prerequisite	L	T	P	C
4		CS423	Advanced Algorithm	Design and Analysis of Algorithm CS206	3	0	0	3
4		CS424	Advanced Algorithm Lab	Advanced Algorithm CS423	0	0	3	1.5
4		IT426	Data Mining Concepts and Techniques	Database Modelling CS325	3	1	0	4
4		IT427	Data Mining Concepts and Techniques Lab	Data Mining Concepts and Techniques IT426	0	0	3	1.5
4		CS425	Advanced Operating System	Operating System CS303	3	0	0	3
4		CS426	Advanced Operating system Lab	Advanced Operating System CS425	0	0	3	1.5
4		IT428	Information Retrieval	Data Structure CS201	3	1	0	4
4		CS429	Information and Coding Theory	Discrete Mathematics MA303	3	0	0	3
4		CS430	Information and Coding Theory Lab	Information and Coding Theory CS429	0	0	3	1.5
4		CS431	Computational Network Analysis	Data Communication and Computer Network IT301	3	1	0	4
4		CS432	Computational Network Analysis Lab	Computational Network Analysis CS431	0	0	3	1.5
4		IT431	Emerging Storage Technologies	Database Management System CS301	3	1	0	4
4		IT432	Emerging Storage Technologies Lab	Emerging Storage Technologies	0	0	3	1.5
4		IT433	Computer Vision	Computer Graphics CS327	3	0	0	3
4	PE 4	CS436	High Performance Computing	Parallel Computing CS421	3	1	0	4
4		CS437	High Performance Computing Lab	High Performance Computing CS430	0	0	3	1.5
4		IT402	.NET Programming	NIL	3	0	0	3
4		IT434	Mobile Computing	NIL	3	0	0	3
4		IT429	Machine Learning	Design and Analysis of Algorithm CS206	3	1	0	4
4		IT430	Machine Learning Lab	Machine Learning IT429	0	0	3	1.5
4		IT490	Natural Language Processing	Compiler Design CS305	3	0	0	3
4		CS494	Big Data Analytics	Database Management System CS301	3	0	0	3
4		CS490	3D Simulation	Computer Graphics CS327	3	0	0	3
4		CS493	GP-GPU Programming	Operating System CS303	3	0	0	3
4		CS494	Big Data Analytics	Database Management System CS301	3	0	0	3

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
OPEN ELECTIVES (OE)*
OFFERED FOR LEVEL 1-4

OE / LEVEL		Code no.	Name of the courses	Prerequisites/ Corequisites cources with code	L	T	P	C
2	**OE1**	CS270	Fundamentals of Computer	NIL	3	0	0	3
		CS271	Fundamentals of Computer	NIL	0	0	3	1.5
		CS201	Data Structure	Programming for Problem Solving	3	1	0	4
		CS202	Data Structure Lab	Data Structure CS201	0	0	3	1.5
		CA201	Object Oriented Programming	NIL	3	0	0	3
		CA202	Object Oriented Programming	NIL	0	0	3	1.5
		CS204	Object Oriented Programming and	Programming for Problem Solving	3	0	0	3
	OE2	CS206	Design and Analysis of Algorithm	Data Structure CS201	3	0	0	3
		CS270	Bio Informatics	Programming for Problem Solving	3	0	0	3
		IT270	Introduction to R	NIL	3	0	0	3
		IT271	Introduction to Python	NIL	3	0	0	3
		CS271	Cyber Law and Security	NIL	3	0	0	3
3	**OE3**	CS301	Database Management System	NIL	3	0	0	3
		CS301	Database Management System Lab	Database Management System	3	0	0	3
		IT305	Software Engineering	NIL	3	0	0	3
		CS325	Database Modelling	Database Management System	3	0	0	3
		IT330	Cryptography & Network Security	Mathematics-I MA	3	0	0	3
		IT331	Bio Metric Security	Data Structure CS201,Design and	3	0	0	3
		CS370	Cyber Crime and Investigation	Design and Analysis of Algorithm	3	0	0	3
		CS371	Genetic Algorithm	Design and Analysis of Algorithm	3	0	0	3
4	**OE4**	IT402	.NET Programming	NIL	0	0	3	1.5
		IT429	Machine Learning	Design and Analysis of Algorithm	3	0	0	3
		IT490	Natural Language Processing	Compiler design CS305	0	0	3	1.5
		IT423	Internet of Things(IoT)	Basics of Intelligent Computing IT	3	0	0	3
		IT420	Artificial Intelligence	Basics of Intelligent Computing IT	3	0	0	3
		CS422	High Performance Computing	NIL	3	0	0	3
		CS470	Wireless communication	Data communication and computer	3	0	0	3
		CS471	Medical Image Processing	NIL	3	0	0	3
		CS472	Programming for Bio Informatics	NIL	3	0	0	3
		IT470	Genomic Data Science	Design and Analysis of Algorithm	3	0	0	3
		CS473	Deep Learning	Machine Learning IT429	3	0	0	3
		IT426	Data Mining Concepts and	Database Management System	3	0	0	3
		IT427	Data Mining Concepts and	Data Mining Concepts and	0	0	3	1.5

* OPEN ELECTIVES TO BE OPTED ONLY BY OTHER DEPARTMENT STUDENTS

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MINOR* REQUIREMENT FOR OTHER BRANCHES
OFFERED FOR LEVEL 2-4

LEVEL	Code no.	Name of the Courses	Prerequisites Courses with code	L	T	P	C
2	CS201	Data Structures	NIL	3	1	0	4
3	CS301	Database Management System	NIL	3	0	0	3
2	CS207	Design and Analysis of Algorithm	NIL	3	1	0	4
3	CS303	Operating System	NIL	3	0	0	3
2	CS205	Computer Organisation Architecture	NIL	3	1	0	4
LABORATORIES							
2	CS202	Data Structures Lab	NIL	0	0	3	1.5
3	CS302	Database Management System Lab	NIL	0	0	3	1.5

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SPECIALIZATION

LEVEL	Specialization area /s	Code No	Name of the courses	Pre requisites / Co requisites	L	T	P	C
4		IT420	Artificial Intelligence	Basics of Intelligent Computing IT 201	3	0	0	3
4		IT429	Machine Learning	Design and Analysis of Algorithm CS206	3	1	0	4
4	Computational Intelligence	IT426	Data Mining Concepts and Techniques	Database Modelling CS325	3	0	0	3
4		IT490	Natural Language Processing	Compiler Design CS305	3	1	0	4
3		IT322	Cloud Computing	Basics of Intelligent Computing IT 201	3	0	0	3
4		IT427	Data Mining Concepts and Techniques Lab	Data Mining Concepts and Techniques IT426	0	0	3	1.5
4		IT421	Artificial Intelligence Lab	Artificial Intelligence IT420	0	0	3	1.5
3		IT326	Wireless Sensor Networks	Data communication and Computer networks IT301	3	1	0	4
3		IT322	Cloud Computing	Basics of Intelligent Computing IT 201	3	0	0	3
4		IT423	Internet of Things(IoT)	Basics Of intelligent Computing IT 201	3	0	0	3
4	Internet of things	IT426	Data Mining Concepts and Techniques	Database Modelling CS325	3	1	0	4
3		CS391	Introduction to Distributed System	NIL	3	0	0	3
4		IT424	Internet of Things(IoT) Lab	Internet of Things(IoT) IT423	0	0	3	1.5
4		IT427	Data Mining Concepts and Techniques Lab	Data Mining Concepts and Techniques IT426	0	0	3	1.5
3		CS327	Computer Graphics	Design and Analysis of Algorithm CS206	3	0	0	3
3		IT307	Image Processing	NIL	3	0	0	3
4	Image Processing & Computer Vision	CS447	Machine Learning	Design and Analysis of Algorithm CS206	3	1	0	4
4		IT433	Computer Vision	Computer Graphics CS327	3	0	0	3
4		CS490	3D Simulation		3	1	0	4
3		IT308	Image Processing Lab	Image Processing IT307	0	0	3	1.5
4		CS491	3D Simulation Lab	NIL	0	0	3	1.5
4		CS436	High Performance Computing	Parallel Computing CS421	3	0	0	3
4		CS421	Parallel Computing	Design and Analysis of Algorithm CS206	3	0	0	3
3	High Performance Computing	CS391	Introduction to Distributed System	Operating System CS303	3	0	0	3
4		CS493	GP-GPU Programming	Operating System CS303	3	1	0	4
4		CS494	Big Data Analytics	Database Management System CS301	3	1	0	4
4		CS422	Parallel Computing Lab	Parallel Computing CS421	0	0	3	1.5
4		CS495	Big Data Analytics Lab	Big Data Analytics CS494	0	0	3	1.5