Established under the Sarala Birla University Act 2017 Govt. of Jharkhand as per Section 2(f) of UGC Act. 1956

CURRICULUM
FOR

Diploma

in
Computer Science & Engineering

(Based on UGC & AICTE- CBCS)

Effective from 2020-21

Definition of Credit

1 Hr. Lecture (L) Per Week	1 Credit
1 Hr. Tutorial (T) Per Week	1 Credit
1 Hr. Practical (P) Per Week	0.5 Credit
2 Hr. Practical (P) Per Week	1 Credit

Course Code Definitions

Course Code	Definitions
BSC-D	Basic Science Course
ESC-D	Engineering Science Course
HSMC-D	Humanities and Social Sciences including Management Course
ECCA-D	Extra Co-Curricular Activities Courses
MC-D	Mandatory Course
PCC-CSE-D	Professional Core Course
PEC-CSE-D	Professional Elective Course
OEC-D	Open Elective Course
CSE-DP-I	Project Stage-I
CSE-DP-II	Project Stage-II
CSE-DP-III	Project Stage-III
CSE-DSI-I	Summer Internship-I
CSE-DSI-II	Summer Internship-II
CSE-DS	Seminar

Structure of Computer Science & Engineering (Diploma)

(Breakup of Credits)

Sl. No.	Category	Breakup of Credits (Total)
1	Humanities and Social Sciences including Management courses	13
2	Basic Science courses	19
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	14
4	Professional core courses	40
5	Professional Elective courses relevant to chosen specialization/branch	14
6	Open subjects – Electives from other technical and /or emerging subjects	11
7	Project work	8
8	Summer internship	5
9	Extra Co-Curricular Activities	2
10	Mandatory Courses	2
Total Credits:		**128**

CREDITS DISTRIBUTION (SEMESTER-WISE AND COURSE-WISE)											
Semester	**HSMC**	**BSC**	**ESC**	**PCC**	**PEC**	**OEC**	**PROJECT**	**SUMMER INTERNSHIP**	**ECCA**	**MC**	**Total Credit Semester-wise**
1st	3	7	5.5	0	0	0	0	0	1	2	**18.5**
2nd	2	12	8.5	0	0	0	0	0	1	0	**23.5**
3rd	2	0	0	15	0	0	0	2	0	0	**19**
4th	2	0	0	16	0	0	2	0	0	0	**20**
5th	0	0	0	9	8	4	2	3	0	0	**26**
6th	4	0	0	0	6	7	4	0	0	0	**21**
Total Credit Course-wise	**13**	**19**	**14**	**40**	**14**	**11**	**8**	**5**	**2**	**2**	**128**
Total Credit											**128**

Humanities and Social Sciences Including Management Course

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	HSMC-D101	Communication Skills in English	2	0	0	2	I
2	HSMC-D102	Communication Skills in English Lab	0	0	2	1	I
3	HSMC-D103	Technical English	2	0	0	2	II
4	HSMC-D104	French Through Communicative Approach-I	2	0	0	2	III
5	HSMC-D105	French Through Communicative Approach-II	2	0	0	2	IV
6	HSMC-D106	Entrepreneurship & Startups	3	1	0	4	VI
					Total Credits:		**13**

Basic Science Courses

Sl. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			L	T	P		
1	BSC-D101	Applied Physics-I	2	1	0	3	I
2	BSC-D102	Applied Physics Lab-I	0	0	2	1	I
3	BSC-D103	Applied Physics-II	2	1	0	3	II
4	BSC-D104	Applied Physics Lab-II	0	0	2	1	II
5	BSC-D105	Applied Chemistry	2	1	0	3	II
6	BSC-D106	Applied Chemistry Lab	0	0	2	1	II
7	BSC-D107	Mathematics-I	2	1	0	3	I
8	BSC-D108	Mathematics-II	3	1	0	4	II
Total Credits:						**19**	

Engineering Science Courses

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	ESC-D101	Introduction to IT Systems	2	1	0	3	I
2	ESC-D102	Introduction to IT Systems Lab	0	0	2	1	I
3	ESC-D103	Engineering Workshop Practice	0	0	3	1.5	I
4	ESC-D104	Fundamentals of Electrical & Electronics Engineering	2	1	0	3	II
5	ESC-D105	Fundamentals of Electrical & Electronics Engineering Lab	0	0	2	1	II
6	ESC-D106	Engineering Graphics	0	0	3	1.5	II
7	ESC-D107	Engineering Mechanics	2	1	0	3	II
Total Credits:						**14**	

Professional Core Courses (Sem III & IV)

Branch: Computer Science and Engineering (Diploma)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PCC-CSE-D201	Computer Programming using C	2:01:00	3	III/IV
2	PCC-CSE-D202	Computer Programming using C Lab	0:00:02	1	III/IV
3	PCC-CSE-D203	Operating Systems	2:00:00	2	III/IV
4	PCC-CSE-D204	Operating Systems Lab	0:00:02	1	III/IV
5	PCC-CSE-D205	Introduction to Database Management System	2:00:00	2	III/IV
6	PCC-CSE-D206	Introduction to Database Management System Lab	0:00:02	1	III/IV
7	PCC-CSE-D207	Computer System Organization	3:00:00	3	III/IV
8	PCC-CSE-D208	Python Programming	1:00:02	2	III/IV
9	PCC-CSE-D209	Object Oriented Programming	2:00:00	2	III/IV
10	PCC-CSE-D210	Object Oriented Programming Lab	0:00:02	1	III/IV
11	PCC-CSE-D211	Data Structures	2:01:00	3	III/IV
12	PCC-CSE-D212	Data Structures Lab	0:00:02	1	III/IV
13	PCC-CSE-D213	Web Technologies	2:00:00	2	III/IV
14	PCC-CSE-D214	Web Technologies Lab	0:00:02	1	III/IV
15	PCC-CSE-D215	Computer Networks	2:00:00	2	III/IV
16	PCC-CSE-D216	Computer Networks Lab	0:00:02	1	III/IV
17	PCC-CSE-D217	Discrete Mathematics	3:00:00	3	III/IV
Total Credits:				**31**	

Professional Core Courses (Sem V & VI)

Branch: Computer Science and Engineering (Diploma)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PCC-CSE-D301	Software Engineering	2:00:00	2	V/VI
2	PCC-CSE-D302	Software Engineering Lab	0:00:02	1	V/VI
7	PCC-CSE-D303	Algorithms	2:01:00	3	V/VI
5	PCC-CSE-D304	Internet of Things	2:01:00	3	V/VI
Total Credits:				**9**	

Professional Elective Courses

Branch: Computer Science and Engineering (Diploma)

SL NO.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	PEC-CSE-D301	Mobile Computing	3:00:00	3	V/VI
2	PEC-CSE-D302	Mobile Computing Lab	0:00:02	1	V/VI
3	PEC-CSE-D303	Multimedia Technologies	3:00:00	3	V/VI
4	PEC-CSE-D304	Multimedia Technologies Lab	0:00:02	1	V/VI
5	PEC-CSE-D305	Advance Computer Networks	3:00:00	3	V/VI
6	PEC-CSE-D306	Advance Computer Networks Lab	0:00:02	1	V/VI
7	PEC-CSE-D307	Information Security	3:00:00	3	V/VI
8	PEC-CSE-D308	Information Security Security Lab	0:00:02	1	V/VI
9	PEC-CSE-D309	Network Forensics	3:00:00	3	V/VI
10	PEC-CSE-D310	Network Forensics Lab	0:00:02	1	V/VI
11	PEC-CSE-D311	FOSS (Free and Open Source Software)	3:00:00	3	V/VI
12	PEC-CSE-D312	FOSS (Free and Open Source Software) Lab	0:00:02	1	V/VI
13	PEC-CSE-D313	Software Testing	3:00:00	3	V/VI
14	PEC-CSE-D314	Software Testing Lab	0:00:02	1	V/VI
15	PEC-CSE-D315	Web App Development	3:00:00	3	V/VI
16	PEC-CSE-D316	Web App Development Lab	0:00:02	1	V/VI
17	PEC-CSE-D317	Image Processing	3:00:00	3	V/VI
18	PEC-CSE-D318	Image Processing Lab	0:00:02	1	V/VI
19	PEC-CSE-D319	Fundamentals of Artificial Intelligence	3:00:00	3	V/VI
20	PEC-CSE-D320	Data Sciences: Data Warehousing and Data Mining	3:00:00	3	V/VI
21	PEC-CSE-D321	Soft Computing	3:00:00	3	V/VI
22	PEC-CSE-D322	Cloud Computing	3:00:00	3	V/VI
23	PEC-CSE-D323	Cyber Law & Ethics	3:00:00	3	V/VI
24	PEC-CSE-D324	Big Data Analytics	3:00:00	3	V/VI

Open Elective Courses

Branch: Computer Science and Engineering (Diploma)

Sl. No.	Course Code	Course Title	Hrs./ Week L: T: P	Credits	Preferred Semester
1	OEC-EEE-D301	Microprocessors & Microcontrollers	3:00:00	3	V/VI
2	OEC-EEE-D302	Microprocessors & Microcontrollers Lab	0:00:02	1	V/VI
3	OEC-ECE-D301	Industrial Automation	3:00:00	3	V/VI
4	OEC-ECE-D302	Industrial Automation Lab	0:00:02	1	V/VI
5	OEC-EEE-D317	Renewable Energy Technologies	3:00:00	3	V/VI

Project

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	CSE-DP-I	Project Stage-I (Minor Project)	0:00:04	2	IV
2	CSE-DP-II	Project Stage-II (Major Project)	0:00:04	2	V
3	CSE-DP-III	Project Stage-III (Major Project Work & Dissertation)	0:00:08	4	VI
Total Credits:				**8**	

Summer Internship

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Course Code	Course Title	Hrs. /Week L: T: P	Credits	Preferred Semester
1	CSE-DSI-I	Summer Internship-I	0:00:00	2	Summer Internship - (4 weeks after II Sem)
2	CSE-DSI-II	Summer Internship-II	0:00:00	3	Summer Internship- (6 weeks after IV Sem)
Total Credits:				**5**	

Mandatory Courses

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	MC-D101	Induction Programme	0	0	0	0	I
2	MC-D102	Environmental Science	2	0	0	2	III
3	MC-D103	Values & Ethics	2	0	0	0	III
4	MC-D104	PDP-I	2	0	0	0	I
5	MC-D105	PDP-II	2	0	0	0	II
6	MC-D106	PDP-III	2	0	0	0	III
7	MC-D107	PDP-IV	2	0	0	0	IV
8	MC-D108	PDP-V	2	0	0	0	V
9	MC-D109	PDP-VI	2	0	0	0	VI
Total Credits:						**2**	

Extra Co-Curricular Activities

Sl. No.	Course Code	Course Title	Hours per week			Credits	Preferred Semester
			L	T	P		
1	ECCA-D101	Sports & Yoga-I	0	0	2	1	I
2	ECCA-D102	Sports & Yoga-II	0	0	2	1	II
Total Credits:						**2**	

COURSE STRUCTURE

SEMESTER-I (1st YEAR)

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Basic Science Course	BSC-D101	Applied Physics-I	2	1	0	3	30	70	100
2	Basic Science Course	BSC-D107	Mathematics-I	2	1	0	3	30	70	100
3	Humanities and Social Sciences including Management Course	HSMC-D101	Communication Skills in English	2	0	0	2	30	70	100
4	Engineering Science Course	ESC-D101	Introduction to IT Systems	2	1	0	3	30	70	100
						Total(A)	**11**	**120**	**280**	**400**
Practical/Drawing/Design										
1	Basic Science Course	BSC-D102	Applied Physics Lab-I	0	0	2	1	30	20	50
2	Engineering Science Course	ESC-D102	Introduction to IT Systems Lab	0	0	2	1	30	20	50
3	Humanities and Social Sciences including Management Course	HSMC-D102	Communication Skills in English Lab	0	0	2	1	30	20	50
4	Engineering Science Course	ESC-D103	Engineering Workshop Practice	0	0	3	1.5	30	20	50
						Total(B)	**4.5**	**120**	**80**	**200**
Mandatory Courses/Extra Co-Curricular Activities Courses										
1	Mandatory Course	MC-D101	Induction Programme	0	0	0	0	0	0	0
2	Mandatory Course	MC-D102	Environmental Science	2	0	0	2	30	70	100
3	Extra Co-Curricular Activities	ECCA-D101	Sports & Yoga-I	0	0	2	1	30	20	50
4	Mandatory Course	MC-D104	PDP-I	2	0	0	0	0	0	0
						Total(C)	**3**	**60**	**90**	**150**
Grand Total (A+B+C)							**18.5**	**300**	**450**	**750**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER II (1st YEAR)

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Basic Science Course	BSC-D105	Applied Chemistry	2	1	0	3	30	70	100
2	Basic Science Course	BSC-D108	Mathematics-II	3	1	0	4	30	70	100
3	Humanities and Social Sciences including Management Course	HSMC-D103	Technical English	2	0	0	2	30	70	100
4	Basic Science Course	BSC-D103	Applied Physics-II	2	1	0	3	30	70	100
5	Engineering Science Course	ESC-D107	Engineering Mechanics	2	1	0	3	30	70	100
6	Engineering Science Course	ESC-D104	Fundamentals of Electrical & Electronics Engineering	2	1	0	3	30	70	100
						Total(A)	**18**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Basic Science Course	BSC-D106	Applied Chemistry Lab	0	0	2	1	30	20	50
2	Basic Science Course	BSC-D104	Applied Physics Lab-II	0	0	2	1	30	20	50
3	Engineering Science Course	ESC-D105	Fundamentals of Electrical & Electronics Engineering Lab	0	0	2	1	30	20	50
4	Engineering Science Course	ESC-D106	Engineering Graphics	0	0	3	1.5	30	20	50
						Total(B)	**4.5**	**120**	**80**	**200**
Mandatory Courses/Extra Co-Curricular Activities Courses										
1	Extra Co-Curricular Activities	ECCA-D102	Sports & Yoga-II	0	0	2	1	30	20	50
2	Mandatory Course	MC-D105	PDP-II	2	0	0	0	0	0	0
						Total(C)	**1**	**30**	**20**	**50**
Grand Total (A+B+C)							**23.5**	**330**	**520**	**850**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER III (2nd YEAR)

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks	
				L	T	P		IA	ESE
Theory									
1	Professional Core Course	PCC-CSE-D201	Computer Programming Using C	2	1	0	3	30	70
2	Professional Core Course	PCC-CSE-D203	Operating Systems	2	0	0	2	30	70
3	Professional Core Course	PCC-CSE-D205	Introduction to Database Management System	2	0	0	2	30	70
4	Professional Core Course	PCC-CSE-D207	Computer System Organization	3	0	0	3	30	70
5	Humanities and Social Sciences including Management Course	HSMC-D104	French Through Communicative Approach-I	2	0	0	2	30	70
						Total(A)	**12**	**150**	**350**
Practical/Drawing/Design									
1	Professional Core Course	PCC-CSE-D202	Computer Programming Using C Lab	0	0	2	1	30	20
2	Professional Core Course	PCC-CSE-D204	Operating Systems Lab	0	0	2	1	30	20
3	Professional Core Course	PCC-CSE-D206	Introduction to Database Management System Lab	0	0	2	1	30	20
4	Professional Core Course	PCC-CSE-D208	Python Programming	1	0	2	2	30	20
6	Summer Internship - (4 weeks after II Sem)	CSE-DSI-I	Summer Internship-I	0	0	0	2	75	25
						Total(B)	**7**	**195**	**105**
Mandatory Courses									
1	Mandatory Course	MC-106	PDP-III	2	0	0	0	0	0
						Total(C)	**0**	**0**	**0**
Grand Total (A+B+C)							**19**	**345**	**455**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

Total
100
100
100
100
100
500
50
50
50
50
200
400
0
0
900

COURSE STRUCTURE

SEMESTER IV (2nd YEAR)

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core Course	PCC-CSE-D209	Object Oriented Programming	2	0	0	2	30	70	100
2	Professional Core Course	PCC-CSE-D211	Data Structures	2	1	0	3	30	70	100
3	Professional Core Course	PCC-CSE-D213	Web Technologies	2	0	0	2	30	70	100
4	Professional Core Course	PCC-CSE-D215	Computer Networks	2	0	0	2	30	70	100
5	Professional Core Course	PCC-CSE-D217	Discrete Mathematics	3	0	0	3	30	70	100
6	Humanities and Social Sciences including Management Course	HSMC-D105	French Through Communicative Approach-II	2	0	0	2	30	70	100
						Total(A)	**14**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Professional Core Course	PCC-CSE-D210	Object Oriented Programming Lab	0	0	2	1	30	20	50
2	Professional Core Course	PCC-CSE-D212	Data Structures Lab	0	0	2	1	30	20	50
3	Professional Core Course	PCC-CSE-D214	Web Technologies Lab	0	0	2	1	30	20	50
4	Professional Core Course	PCC-CSE-D216	Computer Networks Lab	0	0	2	1	30	20	50
5	Project Work	CSE-DP-I	Project Stage-I (Minor Project)	0	0	4	2	75	25	100
						Total(B)	**6**	**195**	**105**	**300**
Mandatory Courses										
1	Mandatory Course	MC-D103	Values & Ethics	2	0	0	0	0	0	0
2	Mandatory Course	MC-107	PDP-IV	2	0	0	0	0	0	0
						Total(C)	**0**	**0**	**0**	**0**
Grand Total (A+B+C)							**20**	**375**	**525**	**900**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER V (3rd YEAR)

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Core Course	PCC-CSE-D301	Software Engineering	2	0	0	2	30	70	100
2	Professional Core Course	PCC-CSE-D303	Algorithms	2	1	0	3	30	70	100
3	Professional Core Course	PCC-CSE-D304	Internet of Things	2	1	0	3	30	70	100
4	Professional Elective Course	PEC-CSE-D303	Multimedia Technologies	3	0	0	3	30	70	100
5	Professional Elective Course	PEC-CSE-D307	Information Security	3	0	0	3	30	70	100
6	Open Elective Course	OEC-EEE-D301	Microprocessors & Microcontrollers	3	0	0	3	30	70	100
						Total(A)	**17**	**180**	**420**	**600**
Practical/Drawing/Design										
1	Professional Core Course	PCC-CSE-D302	Software Engineering Lab	0	0	2	1	30	20	50
3	Professional Elective Course	PEC-CSE-D304	Multimedia Technologies Lab	0	0	2	1	30	20	50
4	Professional Elective Course	PEC-CSE-D308	Information Security Lab	0	0	2	1	30	20	50
5	Open Elective Course	OEC-EEE-D302	Microprocessors & Microcontrollers Lab	0	0	2	1	30	20	50
6	Summer Internship- (6 weeks after IV Sem)	CSE-DSI-II	Summer Internship-II	0	0	0	3	75	25	200
7	Project Work	CSE-DP-II	Project Stage-II (Major Project)	0	0	4	2	75	25	200
						Total(B)	**9**	**270**	**130**	**600**
Mandatory Courses										
1	Mandatory Course	MC-108	PDP-V	2	0	0	0	0	0	
						Total(C)	**0**	**0**	**0**	**0**
Grand Total (A+B+C)							**26**	**450**	**550**	**1200**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination

COURSE STRUCTURE

SEMESTER VI (3rd YEAR)

Branch: Computer Science & Engineering (Diploma)

Sl. No.	Category	Course Code	Course Title	Hours			Credit	Marks		
				L	T	P		IA	ESE	Total
Theory										
1	Professional Elective Course	PEC-CSE-D319	Fundamentals of Artificial Intelligence	3	0	0	3	30	70	100
2	Professional Elective Course	PEC-CSE-D320	Data Sciences: Data Warehousing & Data Mining	3	0	0	3	30	70	100
3	Open Elective Course	OEC-ECE-D301	Industrial Automation	3	0	0	3	30	70	100
4	Open Elective Course	OEC-EEE-D317	Renewable Energy Technologies	3	0	0	3	30	70	100
5	Humanities and Social Science course	HSMC-D106	Entrepreneurship & Startups	3	1	0	4	30	70	100
						Total(A)	**16**	**150**	**350**	**500**
Practical/Drawing/Design										
1	Project Work	CSE-DP-III	Project Stage-III (Major Project Work & Dissertation)	0	0	8	4	300	100	400
2	Open Elective Course	OEC-ECE-D302	Industrial Automation Lab	0	0	2	1	30	20	50
						Total(B)	**5**	**330**	**120**	**450**
Mandatory Courses										
1	Mandatory Course	MC-109	PDP-VI	2	0	0	0	0	0	
						Total(C)	**0**	**0**	**0**	**0**
Grand Total (A+B+C)							**21**	**480**	**470**	**950**

L-Lecture, T-Tutorial, P-Practical

IA- Internal Assessment, ESE-End Semester Examination