SEMESTER-WISE COURSE STRUCTURE OF
4-YR B.Tech. (Computer Science and Engineering) PROGRAMME
(w.e.f. 2014-15)

CS. Coursecode.YY	Course Code	Subject	Contact Hours	Credits
Semester-I				
IS.**BL 101.**14	BL 101	Biology	3-1-0	11
IS.**PHY 101.**14	PHY 101	Physics I	3-1-2	13
IS.**MA 101.**14	MA 101	Engineering Maths- I	3-1-0	11
IE.**CSO 101**.14	CSO 101	Computer Programming	3-1-2	13
EP.**ME 106**.14	ME 106	Manufacturing Practice-II	0-0-3	03
EP.ME 104.14	ME 104	Engineering Drawing	1-0-3	06
IH.**H 101**.14	H 101	Universal Human Values - I: Self and Family	1-2-0	05
		Total	**14-6-10**	**62**
LM.**HL101**.14	HL 101	Basic English	2-0-1	**07**
		Total	**15-6-8**	**63**
GY1		Physical Education/ Creative Practice #	0-0-5	05

CS. Coursecode.YY	Course Code	Subject	Contact Hours	Credits
Semester-II				
IS.MA 102.14	MA 102	Engineering Maths- II	3-1-0	11
IE.EO 101.14	EO 101	Fundamentals of Electrical Engineering	3-1-2	13
MC.CSO 102.15	CSO 102	Data Structures *	3-0-2	11
DC.CSE 101.14 (EP)	CSE 101	Information Technology Workshop-I (ITW-1)	2-0-3	09
EP.ME 105.14	ME 105	Manufacturing Practice – I	0-0-3	03
IH.H 105.14 IH.H 106.14	H 105/ H 106	(Philosophy / Education & Self) #	2-1-0	08
		Total	**13-3-10**	**55**

GY2		Physical Education/ Creative Practice #	0-0-5	**05**

*Multicore subject offered by CSE Dept. to Mathematical Sciences

Semester-III				
CS. Coursecode.YY	**Course Code**	**Subject**	**Contact Hours**	**Credits**
IS.MA202.15	MA202	Probability and Statistics	3-1-0	11
IE.CMO 101.14	CMO101	Engineering Mechanics	3-1-0	11
MC.CSO201.15	CSO201	Discrete Maths +	3-0-0	09
MC.CSO202.15	CSO202	Computer System Organization *	3-0-2	11
DC.CSE201.15	CSE201	Information Technology Workshop-II (ITW-II)	2-0-3	09
IH3.(H103/H104)/ (H105/H106).14	H103/H104/ H105/H106	(History & Civilization / Development of Societies) / (Philosophy /Education & Self)	2-1-0	08
		Total	**16-2-7**	**59**
GY3		Hobbies and Club		

Semester-IV				
CS. Coursecode.YY	**Course Code**	**Subject**	**Contact Hours**	**Credits**
IS.MA 203.14	MA 203	Mathematical Methods	3-1-0	11
DC.CSE 202.15	CSE 202	Artificial Intelligence	3-0-2	11
MC.CSO 203.15	CSO 203	Algorithms *	3-0-2	11
MC.CSO 204.14	CSO 204	Operating Systems	3-0-2	11
DP.CSE291.15	CSE 291	Exploratory Project	0-0-5	05
IH.HL201.14	HL 201	Universal Human Values - II: Self, Society and Family	1-2-0	05

		Total	13-3-11	54
GY4	GY..	Hobbies and Club		

*Multicore subject offered by CSE Dept. to Mathematical Sciences

Semester-V				
CS. Coursecode.YY	Course Code	Subject	Contact Hours (L-T-P)	Credits
IE.MO201.14	MO201	Materials Science and Engineering	3-1-0	11
OE		Open Elective-1	3-0-0/ 3-1-0	9/ 11
DC.CSE301.16	CSE301	Database Management System	3-0-2	11
MC.CSO301.16	CSO301	Computer Graphics*	3-0-2	11
BE.CSE311.16/ BE.CSE321.16/ BE.CSE411.16 DE.CSE302.16/ DE.CSE303.16	CSE311/ CSE321/ CSE411 CSE302/ CSE303	Stream Elective-I/ Non-Stream Elective-I	3-0-2 3-0-0	11/09
LM1.HL301.16	HL301	Professional Communication	2-1-0	08
		Total Credits in the Semester (Regular)	17-2-4	59-61 (Non-Stream)
DP.CSE391.16	CSE391	Stream Project (Hons.)##	0-0-10	10
		Total Credits (Stream, Hons.):	17-2-16	71/73

*Multicore Subject offered by CSE to Math Sc.
+ Multicore Subject offered by Math Sc. to CSE
OE1: Graph Theory and Applications: To be taken by students opting for HPC&DE stream.
Offered by Math. Sc./ or other related course
+-: Multicore subjects for Math Sc and CSE
Extra Stream Project to be carried out by Hons. Students in V Sem.

Semester-VI

CS. Coursecode.YY	Course Code	Subject	Contact Hours (L-T-P)	Credits
OE		Open Elective-2	3-0-0/3-1-0	9/11
DC.CSE304.16	CSE304	Software Engineering	3-0-0	09
MC.CSO302.16	CSO302	Theory of Computation+-	3-0-0	09
DC.CSE305.16	CSE305	Computer Architecture	3-0-2	11
BE.CSE312.16/ BE.CSE322.16/ DE.CSE306.16 DE.CSE307.16	CSE312/ CSE322/ CSE306/ CSE307	Stream Elective-II/ Non-Stream Elective-II	3-0-2/ 3-0-0	11/09
DP.CSE392.16	CSE392	Stream or UG Project	0-0-5	05
IH.H301.16	H301	Humanities Course – New	3-0-0	09
		Total Credits	18-0-9/ 18-1-9	61-63 (Non-Stream) 63-65 (Stream, Hons.)

Semester-VII

CS. Coursecode.YY	Course Code	Subject	Contact Hours	Credits
OE		Open Elective-3	3-0-0/3-1-0	9/11
DC.CSE401.17	CSE401	Compiler Design	3-0-0	09
BE.CSE411.16/ BE.CSE421.17/ BE.CSE311.16 DE.CSE451.17/ DE.CSE452.17/ DE.CSE453.17/ DE.CSE454.17	CSE411/ CSE421/ CSE311 CSE451/ CSE452/ CSE453/ CSE454	Stream Elective-III/ Non-Stream Elective-III	3-0-2/ 3-0-0	11/09
DP.CSE491.17	CSE491	Stream or UG Project#	0-0-10	10
DP.**CSE393**.17	CSE393	^Industrial Training/ Summer Project Evaluation	0-0-0	05

LM.HL501.17	HL501	Academic Writing in Science & Technology	2-1-0	08
		Total Credits in Semester	11-1-12/ 11-2-12	50-52 (Non stream) 52-54 (Stream)

BE: Stream/Bouquet Electives (Any one course depending on chosen stream). These are also
OE: Open Electives for other Branches.
#UG Project to be carried out by every student in VII Sem
^Industrial Training/Summer Project Evaluation [To be carried out in Summer Term after VI Semester and Before VII Sem. (No Contact Hours-Only Exams)]

Semester-VIII				
CS. Coursecode.YY	Course Code	Subject	Contact Hours	Credits
OE		Open Elective-4	3-0-0/3-1-0	9/11
DC.CSE402.17	CSE402	Computer Networks	3-0-2	11
BE.CSE412.17/ BE.CSE422.17	CSE412/ CSE422	Stream Elective-IV/	3-0-2/	11/9
DE.CSE461.17/ DE.CSE462.17/ DE.CSE463.17/ DE.CSE464.17/ DE.CSE465.17/	CSE461/ CSE462/ CSE463/ CSE464/ CSE465	Non-Stream Elective-IV	3-0-0	
IH6.H401.17	H401	Humanities	3-0-0	9
DC.CSE403.17	CSE403	Seminar	0-0-3	3
		Total Credits in Semester	12-0-5/ 12-1-5	**41/43**
DP.CSE492.17	CSE492	Stream Project (Hons.)##	0-0-10	**10**
		Total Credits in Semester (Stream/Hons)	12-0-15/ 12-1-15	**51/53**

Extra Stream Project to be carried out by Stream/Hons. Students in VIII Semester
BE: Stream or Bouquet Electives (Any one course depending on chosen stream).
Note: In VIIIth Semester, students from a specific stream are required to opt for any of the subject from the list of Stream Elective-IV. However, if a student from any stream wishes to study a non-stream subject from the list of Non-stream electives-IV, he/she is allowed to opt for the same.

Total Credits (Semester I-VIII)= 448-456

= 476-484 (Hons.) Stream

(Range is varying depending on the credits of four open electives: 9/11)

List of Stream/Bouquet, Core and Open Elective Courses

I.   B.Tech. (CSE) Streams/Bouquet Courses (Semester VI Onwards):

Streams
1.   **Artificial Intelligence and Computer Vision (AICV)**
2.   **High performance Computing and Data Engineering (HPCDE)**

Stream/Bouquet Elective (BE) Courses (Contact Hours L:T:P=0:0:0) (Credits:09)				
Stream Elective No.	**AICV Electives**		**HPCDE Electives**	
	Course Code	**Subject**	**Course Code**	**Subject**
Stream Elective-I	BE.**CSE311**.16/ BE.**CSE411**.16	Intelligent Computing (IC)/ Natural Language Processing (NLP)	BE.**CSE321**.16	Data Mining
Stream Elective-II	BE.**CSE312**.16	Computer Vision	BE.**CSE322**.16	Parallel Computing
Stream Elective-III	BE.**CSE411**.16/ BE.**CSE311**.16	Natural Language Processing (NLP)/ Intelligent Computing (IC)	BE.**CSE421**.17	Distributed Computing

Stream Elective-IV	BE.**CSE412**.17/ BE.**CSE422**.17/ BE.**CSE413**.17	Pattern Recognition/ Machine Learning/ Biometrics	BE.**CSE422**.17	Machine Learning

Note: In VIIIth Semester, students from a specific stream are required to opt for any of the subject from the list of respective Stream Elective-IV. However, if a student from any stream wishes to study a non-stream subject from the list of Non-stream electives-IV, he/she is allowed to opt for the same.

II.   **List of Non-stream UG Electives: (DE-Department Electives)**

Non-Stream Elective-I (B.Tech. Semester-V) (Contact Hours L:T:P=0:0:0) (Credits:09)		
CSE.Coursecode.YY	**Course code**	**Subject**
DE.CSE302.16	CSE302	Graph Theory and Applications
DE.CSE303.16	CSE303	Multimedia Systems

Note: In Fifth semester the non-stream students may opt above non-stream elective-I or any of the subject from the list of Stream electives –I.

Non-Stream Elective-II (B.Tech. Semester-VI) (Contact Hours L:T:P=0:0:0) (Credits:09)		
CSE.Coursecode.YY	**Course code**	**Subject**
DE.CSE306.16	CSE306	Operations Research
DE.CSE307.17	CSE307	Information Retrieval

Note: In Sixth semester the non-stream students may opt above non-stream elective-II or any of the subject from the list of Stream electives –II.

Non-Stream Elective-III (B.Tech. Semester-VII) (Contact Hours L:T:P=0:0:0) (Credits:09)		
CSE.Coursecode.YY	**Course code**	**Subject**
DE.CSE451.17	CSE451	Neural Networks
DE.CSE452.17	CSE452	Fault Tolerant Computing
DE.CSE453.17	CSE453	Real Time Systems
DE.CSE454.17	CSE454	Software Re-use and Re-engineering

Note: In Seventh semester the non-stream students may opt any of the above non-stream elective-II subject or any of the subject from the list of Stream electives –III.

Non-Stream Elective-IV (B.Tech. Semester-VIII) (Contact Hours L:T:P=0:0:0) (Credits:09)		
CSE.Coursecode.YY	**Course code**	**Subject**
DE.CSE461.17	CSE461	Advanced Databases
DE.CSE462.17	CSE462	Data Compression
DE.CSE463.17	CSE463	Cyber Security
DE.CSE464.17	CSE464	Soft Computing
DE.CSE465.17	CSE465	Cryptography

Note: 1**.** In Eighth semester the non-stream students may opt any of the above non-stream elective-IV subject or any of the subject from the list of Stream electives –IV.
2. In VIIIth Semester, students from a specific stream are required to opt for any of the subject from the list of respective Stream Elective-IV. However, if a student from any stream wishes to study a non-stream subject from the list of Non-stream electives-IV, he/she is allowed to opt for the same.

III. List of Open Electives offered from CSE Dept.

1. **Open Elective-1 (OE-1): (Semester-V) [3-0-0/3-1-0: 9/11 credits]**

   DC.CSO. 302.16/ OE.CSO. 302.16: Computer Graphics (3-0-2: 11 Credits)

   Any one of the following which is running as stream elective in current semester:
   BE.CSE311.16/ OE.CSE311.16: Intelligent Computing/
   BE.CSE411.17/ OE.CSE411.17: Natural Language Processing (NLP)
   BE.CSE321.16/OE.CSE321.16: Data Mining

2. **Open Elective-2 (OE-2): (Semester-VI) [3-0-2:11 Credits]**

   BE.CSE312.16/ OE.CSE311.16: Computer Vision
   BE.CSE322.16/OE.CSE321.16: Parallel Computing

3. **Open Elective-3 (OE-3): (Semester-VII) [3-0-2:11 Credits]**
   Any one of the following which is running as stream elective in current semester:

   BE.CSE411.17/ OE.CSE411.17: Natural Language Processing (NLP)/
   BE.CSE311.16/ OE.CSE311.16: Intelligent Computing/
   BE.CSE421.17/ OE.CSE421.17: Distributed Computing

4. **Open Elective-4 (OE-4): (Semester-VIII) [3-0-2:11 Credits]**
   Any one of the following which is running as stream elective in current semester:
   BE.CSE412.17/ OE.CSE412.17: Pattern Recognition/

BE.CSE413.17/ OE.CSE413.17:: Biometrics/
BE.CSE423.17/ OE.CSE423.17: Machine Learning

<table>
<tr><td colspan="5">SUMMARY OF CREDIT ALLOCATION
4-YR B.Tech Programme (Computer Science and Engineering)</td></tr>
<tr><td>Category</td><td>Type of Course</td><td>No. of Courses</td><td>Prescribed Credits</td><td>Allocated Credits</td></tr>
<tr><td>IS</td><td>Institute Science</td><td>6</td><td>62-84</td><td>68</td></tr>
<tr><td>IE</td><td>Institute Engineering</td><td>4</td><td>41-60</td><td>48</td></tr>
<tr><td>DC/MC</td><td>Dept. Core/ Multicore</td><td>15
(8 core+7 multicore)</td><td>105-155</td><td>147</td></tr>
<tr><td>DE/BE</td><td>Dept. Elective/ Bouquet/Stream Elective</td><td>4</td><td>30-60</td><td>36-44 (Non-stream /Stream)</td></tr>
<tr><td>OE</td><td>Open Elective</td><td>4</td><td>35-70</td><td>36-44 (depending on credits 9/11)</td></tr>
<tr><td>DP</td><td>Department Project/Industrial Training</td><td></td><td>20-50</td><td>25- (Non-Stream)
45 (Stream)</td></tr>
<tr><td>EP</td><td>Engineering Practice</td><td>4</td><td>20-24</td><td>21</td></tr>
<tr><td>IH</td><td>Institute Humanities</td><td>6</td><td>41-60</td><td>44</td></tr>
<tr><td>LM</td><td>Language Management</td><td>3</td><td>20-24</td><td>23</td></tr>
<tr><td>GY</td><td>Gymkhana Courses</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>Total Courses: 48</td><td></td><td>Total Credits: 448-456 (476-484: Stream/Hons)</td></tr>
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<tr><td colspan="5">SUMMARY SHEET OF PROGRAMME COMPONENTS
4-YR B.Tech Programme (Computer Science and Engineering)</td></tr>
<tr><td>S.NO.</td><td>Category</td><td>Programme Components</td><td>%</td><td>%</td></tr>
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			(Approved Credit Limits)	(Allocated Credit Limits)
1.	HU	Humanities and Social Science*	10 (41-50)	10 (44)
2.	IS	Institute Science*	15 (62-84)	15 (68)
3.	IE	Institute Requirement Engineering*	10 (41-60)	11 (48)
4.	EP	Engineering Drawing (Manual and Computer Aided), Manufacturing Practices and Practice course of Department*	5 (20-24)	5 (21)
5.	LM	Language and Management*	5 (20-24)	5 (23)
6.	DC/MC	Department/Programme Core (Includes Stream Courses)	25-30 (105-155)	32 (147)
7.	DE/BE	Department/Programme Elective (Includes Stream Courses)	7-10 (30-60)	9 (36-44) (Non-stream /Stream)
8.	OE	Open Elective (Interdisciplinary Stream courses from Science/ Engineering/Pharmacy) (Room for Minor with some additional Credits)	8-15 (35-70)	8-10 (36-44) (depending on credits 9/11)
9.	DP	Project/ Industrial visit/ Training	5-10 (20 – 50)	7-9 (25, 45 (stream))
				Total Credits: 448-456 (476-484: Stream/Hons)

*Institute Requirements
Department Programme Core (DC) Courses also include Multi-Departmental Core Courses
Department/Programme Elective (DE) Courses also include Bouquet Elective (BE) Courses.