

## UG Course Structure for Computer Science and Engineering (2015-2016)

Cat.	Deviation	Programme Components	CSE	Recommended (V Years)	
				Min	Max
HU	0	Humanities and Social Science	44	41	50
IS	0	Science	68	62	84
IE	0	Institute Requirement Engineering/ Pharmacy	48	41	60
EP	0	Engineering Drawing (Manual and Computer Aided), Manufacturing Practices and Practice course of Department / School	21	20	24
LM	0	Language and Management	18	20	24
DC/ MC	0	Department/Programme Core (Includes Stream Courses)	147	105	155
DE/ BE	0	Department/Programme Elective (Includes Stream Courses)	36	30	60
OE	0	Open Elective (Interdisciplinary Stream courses from Science/ Engineering/Pharmacy)	36	35	80
DP	0	Project/ Industrial visit/ Training	30	20	50
DT	0	Dissertation	0	0	0
		<b>Total</b>	<b>448</b>	<b>430</b>	<b>460</b>
		<b>All Semester Total (Hons.)</b>	<b>468</b>	<b>450</b>	<b>480</b>

L: Lecture hours; T: Tutorial hours; P: Laboratory/ Practical hours; C: Credits

### Streams in Computer Science and Engineering

1. Artificial Intelligence and Computer Vision (AICV)

2. High performance Computing and Data Engineering (HPCDE)

#### 1. Artificial Intelligence and Computer Vision (AICV) Electives

Stream Elective-I (V Semester)	DE.CSE342.16	Intelligent Computing (IC)				
	DE.CSE443.16	Natural Language Processing (NLP)				
Stream Elective-II (VI Semester)	DE.CSE352.16	Computer Vision				
Stream Elective-III (VII Semester)	DE.CSE443.16	Natural Language Processing (NLP)/				
	DE.CSE342.16	Intelligent Computing (IC)				
Stream Elective-IV (VIII Semester)	DE.CSE454.17	Pattern Recognition/				
	DE.CSE464.17	Machine Learning/				
	DE.CSE456.17	Biometrics				

#### 2. High performance Computing and Data Engineering (HPCDE) Electives

Stream Elective-I (V Semester)	DE.CSE362.16	Data Mining				
Stream Elective-II (VI Semester)	DE.CSE371.16	Parallel Computing				
Stream Elective-III (VII Semester)	DE.CSE472.17	Distributed Computing				
Stream Elective-IV (VIII Semester)	DE.CSE464.17	Machine Learning				

**UG Course Structure for Computer Science and Engineering (2015-2016)**

UG-CRC Code	Course Code	Course Name	L-T-P			Credits
<b>Section-BA1 Computer Science and Engineering : 4-Year B. Tech. I-Semester</b>						
IH.H101.14	H101	Universal Human Values - I: Self and Family	1	1	0	5
GY.PE101.14	PE101	Elementary Physical Education	0	1	3	5
GY.CP101.14	CP101	Creative Practices #	0	1	3	5
		<b>Total</b>	<b>1</b>	<b>3</b>	<b>6</b>	<b>15</b>
LM.HL101.14	HL101	Basic English*	2	0	1	7
		<b>Total</b>	<b>3</b>	<b>3</b>	<b>7</b>	<b>22</b>

#Creative Practices course to be announced by Dean Academic Office

\*Basic English course to be taken by student as recommended after Diagnostic Test

UG-CRC Code	Course Code	Course Name	L-T-P			Credits
<b>Section-BA1 Computer Science and Engineering : 4-Year B.Tech. I-Semester</b>						
IS.BL 101.14	BL 101	Biology	3	1	0	11
IS.PHY 101.14	PHY 101	Physics I: Classical, Quantum & Relativistic Mechanics	3	1	2	13
IS.MA 101.14	MA 101	Engineering Mathematics- I	3	1	0	11
IE.CSO 101.14	CSO 101	Computer Programming	3	1	2	13
EP.ME 106.14	ME 106	Manufacturing Practices-II	0	0	3	3
EP.ME 104.14	ME 104	Engineering Drawing	1	0	3	6
		<b>Total</b>	<b>13</b>	<b>4</b>	<b>10</b>	<b>57</b>

<b>Section-BA1 Computer Science and Engineering : 4-Year B. Tech. II-Semester</b>						
IS.MA 102.14	MA 102	Engineering Mathematics- 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
EP.CSE101.14	CSE101	Information Technology Workshop-I (ITW-1)	2	0	3	9
EP.ME 105.14	ME 105	Manufacturing Practices – I	0	0	3	3
IH.H105.14	H 105	Philosophy	2	1	0	8
IH.H 106.14	H 106	Education & Self #				
		<b>Total</b>	<b>13</b>	<b>3</b>	<b>10</b>	<b>55</b>

\* The students have to choose one course from H105 & H106.

<b>Section-BA1 Computer Science and Engineering : 4-Year B. Tech. III-Semester</b>						
IS.MA202.14	MA202	Probability and Statistics	3	1	0	11
IE.CMO102.14	ME102	Engineering Mechanics	3	1	0	11
MC.CSO204N.15	CSO204N	Discrete Maths +	3	0	0	9
MC.CSO211N.15	CSO211N	Computer System Organization*	3	0	2	11
DC.CSE205N.15	CSE205N	Information Technology Workshop-II (ITW-II)	2	0	3	9
IH.H103.14	H103	Development of Societies	2	1	0	8
IH.H104.14	H104	History & Civilization				
		<b>Total</b>	<b>16</b>	<b>3</b>	<b>5</b>	<b>59</b>

\*The Students have to choose one course from H103 & H104.

Section-BA1	Computer Science and Engineering : 4-Year B. Tech. IV-Semester					
IS.MA 203.14	MA 203	Mathematical Methods	3	1	0	11
DC.CSE241N.15	CSE241N	Artificial Intelligence	3	0	2	11
MC.CSO221N.15	CSO221N	Algorithms *	3	0	2	11
MC.CSO231N.14	CSO231N	Operating Systems*	3	0	2	11
DP.CSE291.15	CSE 291	Exploratory Project	0	0	5	5
HU.H201.14	HL 201	Universal Human Values - II: Self, Society and Nature	1	2	0	5
<b>Total</b>			<b>13</b>	<b>3</b>	<b>11</b>	<b>54</b>

Section-BA1	Computer Science and Engineering : 4-Year B. Tech. V-Semester					
IE.MO201.14	MO201	Materials Science and Engineering	3	1	0	11
OE - 1	OE - 1	Open Elective - 1	3	0	0	9
DC.CSE361.16	CSE361	Database Management System	3	0	2	11
MC.CSO351.16	CSO351	Computer Graphics*	3	0	2	11
DE - 1	DE - 1	Department Elective/Stream Elective (DE) - 1	3	0	0	9
		Non-Stream Elective ( (DE) - 1				
HU/LM	HU/LM	Humanities/Language Management Courses^^	3	0	0	9
<b>Total Credits in the Semester</b>			<b>18</b>	<b>1</b>	<b>4</b>	<b>60</b>
(Regular-Non-Stream)						
DP.CSE391.16	CSE.391	Stream Project (Hons.)	0	0	10	10
<b>Total Credits (Stream, Hons.)</b>			<b>18</b>	<b>1</b>	<b>14</b>	<b>70</b>

^^ Courses to be selected such that recommended HU/LM programme components get satisfied separately.

#### \*V Semester Elective / Stream DE-1 Courses

DE.CSE342.16	CSE342	Intelligent Computing	3	0	0	9
DE.CSE362.16	CSE362	Data Mining	3	0	0	9
DE.CSE443.16	CSE443	Natural Language Processing	3	0	0	9

#### \*V Semester Elective / Non Stream DE-1 Courses

DE.CSO323.16	CSO323	Graph Theory and Applications+	3	0	0	9
DE. CSE353.16	CSE353	Multimedia Systems	3	0	0	9
DE. CSO332.16	CSO332	Ubiquitous Computing	3	0	0	9

#### V Semester Open Elective OE-1 Courses

DE.CSE342.16	CSE342	Intelligent Computing	3	0	0	9
DE.CSE362.16	CSE362	Data Mining	3	0	0	9
DE.CSE443.16	CSE443	Natural Language Processing	3	0	0	9
DE.CSO332.16	CSO332	Ubiquitous Computing	3	0	0	9

Section-BA1	Computer Science and Engineering : 4-Year B. Tech. VI-Semester					
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OE - 2	OE - 2	Open Elective - 2	3	0	0	9
DC.CSE381.16	CSE381	Software Engineering	3	0	0	9
MC. CSO322.16	CSO322	Theory of Computation	3	0	0	9
DC. CSE312.16	CSE312	Computer Architecture	3	0	2	11
DE - 2	DE - 2	Department Elective/Stream Elective(DE) - 2	3	0	0	9
		Non-Stream Elective (DE) - 2				
DP.CSE392.16	CSE392	Stream or UG Project	0	0	10	10
HU/LM	HU/LM	Humanities/Language Management Courses^^	3	0	0	9
<b>Total Credits</b>			<b>18</b>	<b>0</b>	<b>12</b>	<b>66</b>

^^ Courses to be selected such that recommended HU/LM programme components get satisfied separately.

**\*VI Semester Elective / Stream DE - 2 Courses**

DE.CSE352.16	CSE352	Computer Vision	3	0	0	9
DE.CSE371.16	CSE371	Parallel Computing	3	0	0	9

**\*VI Semester Elective / Non Stream DE - 2 Courses**

DE. CSE324.16	CSE324	Operations Research	3	0	0	9
DE.CSE363.16	CSE363	Information Retrieval	3	0	0	9

**VI Semester Open Elective OE - 2 Courses**

DE. CSE352.16	CSE352	Computer Vision	3	0	0	9
DE. CSE371.16	CSE371	Parallel Computing	3	0	0	9

**Computer Science & Engineering: 4-Year B.Tech. Summer Term (After VI Sem.)**

DP.CSE393.15	CSE393	Project / Industrial Project / Industrial Training	0	0	5	5
<b>Total</b>			<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>

**Section-BA1**

**Computer Science and Engineering: 4-Year B. Tech. VII-Semester**

OE - 3	OE - 3	Open Elective - 3	3	0	0	9
DC. CSE425.17	CSE425	Compiler Design	3	0	0	9
DE - 3	DE - 3	Department Elective/Stream Elective(DE) - 3	3	0	0	9
		Non-Stream Elective (DE) - 3				
DP.CSE491.17	CSE491	UG Project	0	0	10	10
HU/LM	HU/LM	Humanities/Language Management Courses^^	3	0	0	9
<b>Total Credits in Semester (Regular/Non-Stream)</b>			<b>12</b>	<b>0</b>	<b>10</b>	<b>46</b>

^^ Courses to be selected such that recommended HU/LM programme components get satisfied separately.

**VII Semester Elective / Stream DE-3 Courses**

DE.CSE342.16	CSE342	Intelligent Computing	3	0	0	9
DE.CSE443.16	CSE443	Natural Language Processing (NLP)	3	0	0	9
DE. CSE472.17	CSE472	Distributed Computing	3	0	0	9

**\*VII Semester Elective / Non Stream DE - 3 Courses**

DE.CSE444.17	CSE444	Neural Networks	3	0	0	9
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DE.CSE434.17	CSE434	Fault Tolerant Computing	3	0	0	9
DE.CSE435.17	CSE435	Real Time Systems	3	0	0	9
DE.CSE482.17	CSE482	Software Re-use and Re-engineering	3	0	0	9
DE. CSE583.18	CSE583	Advanced Software Engg.	3	0	0	9
DE. CSE559.18	CSE559	Medical Image Processing	3	0	0	9
DE. CSE529.18	CSE529	Bio-Informatics Algorithms	3	0	0	9
DE. CSE582.18	CSE582	Software Reuse and Re-engineering	3	0	0	9
DE. CSE539.18	CSE539	Social Network Analysis	3	0	0	9
DE. CSE573.18	CSE573	Parallel Algorithms	3	0	0	9
DE. CSE530.18	CSE530	Information Security	3	0	0	9
DE. CSE546.18	CSE546	Robotics	3	0	0	9
DE. CSE585.18	CSE585	Software Engineering Project Management	3	0	0	9
DE. CSE574.18	CSE574	Cloud Computing	3	0	0	9

### VII Semester Open Elective OE-3 Courses

DE.CSE342.16	CSE342	Intelligent Computing	3	0	0	9
DE.CSE443.16	CSE443	Natural Language Processing (NLP)	3	0	0	9
DE.CSE472.17	CSE472	Distributed Computing	3	0	0	9

### Section-BA1

### Computer Science and Engineering: 4-Year B. Tech. VIII-Semester

OE - 4	OE - 4	Open Elective - 4	3	0	0	9
DC. CSE433.17	CSE433	Computer Networks	3	0	2	11
DE - 4	DE - 4	Department Elective/Stream Elective(DE) - 4	3	0	0	9
		Non-Stream Elective (DE) - 4				
HU/LM	HU/LM	Humanities/Language Management Courses^^	3	0	0	9
DC.CSE403.17	CSE403	Seminar	0	0	3	3
<b>Total Credits in Semester</b>			<b>12</b>	<b>0</b>	<b>5</b>	<b>41</b>
DP.CSE492.17	CSE492	Stream Project (Hons.)	0	0	10	10
<b>Total Credits in Semester (Hons.)</b>			<b>12</b>	<b>0</b>	<b>15</b>	<b>51</b>

^^ Courses to be selected such that recommended HU/LM programme components get satisfied separately.

### VIII Semester Elective / Stream DE-4 Courses (Elective-IV)

DE.CSE454.17	CSE454	Pattern Recognition	3	0	0	9
DE.CSE456.17	CSE456	Biometrics	3	0	0	9
DE.CSE464.17	CSE464	Machine Learning	3	0	0	9

### VIII Semester Elective / Non Stream DE - 4 Courses (Elective-II)

DE.CSE436.17	CSE436	Cyber Security	3	0	0	9
DE.CSE426.17	CSE426	Cryptography	3	0	0	9
DE.CSE457.17	CSE457	Data Compression	3	0	0	9
DE.CSE458.17	CSE458	Soft Computing	3	0	0	9
DE.CSE465.17	CSE465	Advanced Databases	3	0	0	9
DE.CSE537.17	CSE537	Network Security	3	0	0	9

DE.CSE528.17	CSE528	Approximation Algorithms	3	0	0	9
DE.CSE538.17	CSE538	Semantic Web	3	0	0	9
DE.CSE568.17	CSE568	Web Mining	3	0	0	9
<b>VIII Semester Open Elective OE - 4 Courses</b>						
DE.CSE454.17	CSE454	Pattern Recognition	3	0	0	9
DE.CSE456.17	CSE456	Biometrics	3	0	0	9
DE.CSE464.17	CSE464	Machine Learning	3	0	0	9
L: Lecture hours; T: Tutorial hours; P: Laboratory/ Practical hours; C: Credits						