

**RAYAT-BAHRA UNIVERSITY**  
**University School of Engineering & Technology (USET)**  
**Department of Computer Science & Engineering**  
**Bachelor of Technology (Computer Science & Engineering)**  
**Course Structure - B.Tech. (CSE) - Four Years - Eight Semesters**

**Sem-I (Year-I)** **Category of Course**

S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	AMG001	Applied Math -I	2	1	0	3   3	School Core	Foundation Core
2	ASG001/ASG002	Applied Physics*/ Industrial Chemistry*	3	0	1	4   5	School Core	Foundation Core
3	EEG001	Basics of Electrical Engineering	2	0	1	3   4	School Core	Foundation Core
4	MEG001	Basics of Mechanical Engineering & Workshop - SEC -I	2	0	2	4   6	School Core	Foundation Core/SEC
5	CSG001	Fundamentals of Computers & Languages	2	0	1	3   4	School Core	Foundation Core
6	CSENNN	DSE - I (or Industry Partner Course - I)	3	0	0	3   3	Dept Elective	DSE
7	OPUNNN	UE (Open) - I	2	0	0	2   2	Univ Elective	Open Elective
8	HMU101	Essentials of Management - UE (H&M) -I - GE - I	2	0	0	2   2	Univ Elective	AECC
9	MCG001	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core

Credits =24.5 | Hours=30

**Sem-II (Year-I)** **Category of Course**

S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	AMG002	Applied Math - II	2	1	0	3   3	School Core	Foundation Core
2	ASG002/ASG001	Industrial Chemistry*/ Applied Physics*	3	0	1	4   5	School Core	Foundation Core
3	ECG001	Basics of Electronics	2	0	1	3   4	School Core	Foundation Core
4	CEG001	Basics of Civil & Environmental Studies	3	0	0	3   3	School Core	Foundation Core
5	ECG401	Instrumentation for Engineers & Scientists - SEC - II	2	0	1	3   4	School Core	Foundation Core/SEC
6	MEG051/HVU100	Engineering Drawing and Practical Geometry - SEC - III/ Human Values and Professional Ethics - AECC - II	1/2	0	2/1	3   5/4	School Core	Foundation Core/SEC
7	CSENNN	DSE - II (or Industry Partner Course - II)	3	0	0	3   3	Dept Elective	DSE
8	CPU200	English Communication & Soft Skills - UE (C&PD) - I - AECC -I	2	0	0	2   2	Univ Elective	Interdisc/Generic Elective
9	MCG002	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core

Credits=24.5 | Hours= 30/29

**Sem-III (Year-II)** **Category of Course**

S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	AMG003	Applied Math - III	2	1	0	3   3	School Core	Foundation Core
2	CEG058	Materials Science & Engineering	3	0	1	4   5	School Core	Foundation Core
3	MEG052	Engineering Design	3	0	0	3   3	School Core	Foundation Core
4	HVU100/MEG051	Human Values and Professional Ethics - AECC - II/ Engineering Drawing and Practical Geometry - SEC - III	2/1	0	1/2	3   4/5	School Core	AECC
5	CSG053	Object Oriented Programming - DSC - I	2	0	1	3   4	Dept Core	DSC
6	CSG251	Data Structures - DSC - II	2	0	1	3   4	Dept Core	DSC
7	CSENNN	DSE - III (or Industry Partner Course - III)	3	0	0	3   3	Dept Elective	DSE
8	OPUNNN	UE(Open) - II	2	0	0	2   2	Univ Elective	Open Elective
9	PRG001	Industrial Tour* - SEC - IV	0	0	0	1   1	Essential Comp	SEC
10	MCG003	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core

Credits=25.5 | Hours= 30/31

\* from preceding Summer

**Sem-IV (Year-II)** **Category of Course**

S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	CEG060	Nanomaterials & Nanotechnology	2	0	0	2   2	School Core	Foundation Core
2	ASG005	Statistical Analysis & Techniques - Sec - V	2	1	0	3   3	School Core	Foundation Core
3	CSS100	Functional Materials in Computer Engineering - SE - I	3	0	0	3   3	School Elective	Foundation Elective
4	CSG301	Data Communication & Computer Networks DSC - III	2	0	1	3   4	Dept Core	DSC
5	CSG101	Operating System DSC - IV	3	0	1	4   5	Dept Core	DSC
6	ECG102	Microprocessor and Programming DSC - V	3	0	1	4   5	Dept Core	DSC
7	CSENNN	DSE - IV (or Industry Partner Course - IV)	3	0	0	3   3	Dept Elective	DSE
8	CSENNN	DSE - V	2	0	0	2   2	Dept Elective	DSE
9	HMUNNN	Strategic Management - UE (H&M)-II - GE-II	2	0	0	2   2	Univ Elective	Interdisc/Generic Elective
10	MCG004	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core

Credits=26.5 | Hours=30

Sem-V (Year-III)							Category of Course	
S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	CSG002	Weighting & MCDM Techniques	3	1	1	5   6	School Core	Foundation Core
2	CSS101	Discrete Mathematics - SE - II	2	0	1	3   4	School Elective	Foundation Elective
3	CSG051	Programming in Java - DSC - VI	2	0	1	3   4	Dept Core	DSC
4	CSG252	Theory of Computation - DSC - VII	3	1	0	4   4	Dept Core	DSC
5	CSG302	Cloud Computing - DSC - VIII	3	0	0	3   3	Dept Core	DSC
6	CSENNN	DSE - VI (or Industry Partner Course - V)	3	0	0	3   3	Dept Elective	DSE
7	OPUNNN	UE (Open) - III	2	0	0	2   2	Univ Elective	Open Elective
8	CPU201	Image Management & Technical Skills - UE (C&PD)-II - AECC-III	2	0	0	2   2	Univ Elective	AECC
9	PTG001	Industrial Training - I * - SEC - VI	0	0	0	2   0	Essential Comp	SEC
10	TPG001	Term Paper - SEC -VII	1	0	0	1   1	Essential Comp	SEC
11	MCG005	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core
12	DPG001	Progression Interview by Dean & HoD	0	0	0	1   0	Essential Comp	Foundation Core

Credits=29.5 | Hours=30

\* from preceding Summer

Sem-VI (Year-III)							Category of Course	
S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	CSS102	Simulation & Modeling - SE -III	2	1	0	3   3	School Elective	Foundation Elective
2	CSG151	Relational Database Management System-I - DSC - IX	3	0	1	4   5	Dept Core	DSC
3	CSG201	Computer Graphics - DSC - X	2	0	1	3   4	Dept Core	DSC
4	CSG401	Network Security and Cryptography - DSC - XI	4	0	0	4   4	Dept Core	DSC
5	CSG451	Mobile Application Development	3	0	0	3   3	Dept Core	DSC
6	CSENNN	DSE - VII (or Industry Partner Course -VI)	3	0	0	3   3	Dept Elective	DSE
7	CSENNN	DSE - VIII	3	0	0	3   3	Dept Elective	DSE
8	HMUNNN	Counselling & Negotiating Skills for Managers- UE (H&M)-III - GE-III	2	0	0	2   2	Univ Elective	Interdisc/Generic Elective
9	SPG001	Technical Seminar - SEC - VIII	1	0	0	1   1	Essential Comp	SEC
10	MCG006	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core

Credits=26.5 | Hours=29

Sem-VII (Year-IV)							Category of Course	
S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	CSG152	Relational Database Management System - I I - DSC - XIII	2	0	1	3   4	Dept Core	DSC
2	CSG453	Natural Language Processing - DSC - XIV	2	1	0	3   3	Dept Core	DSC
3	CSG102	Unix and Shell Programming - DSC - XV	2	0	1	3   4	Dept Core	DSC
4	CSENNN	DSE- IX (or Industry Partner Course -VII)	3	0	0	3   3	Dept Elective	DSE
5	OPUNNN	UE (Open) - IV	2	0	0	2   2	Univ Elective	Open Elective
6	HMUNNN	Leadership & Entrepreneurship - UE (H&M)- IV -GE-IV	2	0	0	2   2	Univ Elective	Interdisc/Generic Elective
7	MNG001	Minor Project - SEC-IX	0	0	0	4   4	Essential Comp	SEC
8	PTG002	Industrial Training - II *	0	0	0	2   0	Essential Comp	SEC
9	MCG007	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core

Credits=22.5 | Hours=23

\* from preceding Summer

Sem-VIII (Year-IV)							Category of Course	
S.No.	Code	Course Title	L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
1	MJG001	Major Project & Presentation - SEC - X	0	0	0	9   8	Essential Comp	SEC
2	PNG001	Internship	0	0	0	10   0	Essential Comp	SEC
3	MCG008	Student Mentoring & Counselling	0	0	0.5	0.5   1	Essential Comp	Foundation Core
4	DXG001	Dean & HoD's & Guide's Exit Interview	0	0	0	1   0	Essential Comp	Foundation Core

Credits=20.5 | Hours=17

**Total No. of Credits in B.Tech. (Computer Science & Engineering) - 200**

**PLEASE NOTE:**

- Each Lecture and Tutorial Credit has one Contact hour and Each Practical Credit has two contact hours;
- UE (H&M) = University Elective (Humanities & Management);  
 UE (C&PD) = University Elective (Communication & Personality Development);  
 UE (OE) = University Elective (Open Elective);  
 SC = School Core; SE = School Elective; DC = Department Core; DE = Department Elective;  
 SEC = Skill Enhancement Course; AECC = Ability Enhancement Compulsory Course;  
 AEC = Ability Enhancement Courses (AECC and SEC);  
 DSC = Department Specific Core; DSE = Department Specific Elective;  
 GE = Generic or Interdisciplinary Elective;

## Sem-I (Year-I)

S.No.	Code	Course Title
1	AMG001	Applied Math - I
2	ASG001/ASG002	Applied Physics*/ Industrial Chemistry*
3	EEG001	Basics of Electrical Engineering
4	MEG001	Basics of Mechanical Engineering & Workshop - SEC - I
5	CSG001	Fundamentals of Computers & Languages
6	CSE100	Fundamentals of Android Development for Beginners ( Industry Partner Course - I)
7	OPUNNN	UE (Open) - I
8	HMU101	Essentials of Management - UE (H&M) -I - GE - I
9	MCG001	Student Mentoring & Counselling

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## Sem-II (Year-I)

S.No.	Code	Course Title
1	AMG002	Applied Math - II
2	ASG002/ASG001	Industrial Chemistry*/ Applied Physics*
3	ECG001	Basics of Electronics
4	CEG001	Basics of Civil & Environmental Studies
5	ECG401	Instrumentation for Engineers & Scientists - SEC - II
6	MEG051/HVU100	Engineering Drawing and Practical Geometry - SEC - III/ Human Values and Professional Ethics - AECC - II
7	CSE104	Developing Android Applications (Industry Partner Course - II)
8	CPU200	English Communication & Soft Skills - UE (C&PD) - I - AECC - I
9	MCG002	Student Mentoring & Counselling

Cred

## Sem-III (Year-II)

S.No.	Code	Course Title
1	AMG003	Applied Math - III
2	CEG058	Materials Science & Engineering
3	MEG052	Engineering Design
4	HVU100/MEG051	Human Values and Professional Ethics - AECC - II/ Engineering Drawing and Practical Geometry - SEC - III
5	CSG053	Object Oriented Programming - DSC - I
6	CSG251	Data Structures - DSC - II

7	CSE105	Advanced Android App Development (Industry Partner Course - III)
8	OPUNNN	UE(Open) - II
9	PRG001	Industrial Tour* - SEC - IV
10	MCG003	Student Mentoring & Counselling

Cred

\* from preceding Summer

**Sem-IV (Year-II)**

S.No.	Code	Course Title
1	CEG060	Nanomaterials & Nanotechnology
2	ASG005	Statistical Analysis & Techniques - Sec - V
3	CSS100	Functional Materials in Computer Engineering - SE - I
4	CSG301	Data Communication & Computer Networks DSC - III
5	CSG101	Operating System DSC - IV
6	ECG102	Microprocessor and Programming DSC - V
7	CSE106	Google Play Services (Industry Partner Course - IV)
8	CSENNN	DSE - V
9	HMUNNN	Strategic Management - UE (H&M)-II - GE-II
10	MCG004	Student Mentoring & Counselling

**Sem-V (Year-III)**

S.No.	Code	Course Title
1	CSG002	Weighting & MCDM Techniques
2	CSS101	Discrete Mathematics - SE - II
3	CSG051	Programming in Java - DSC - VI
4	CSG252	Theory of Computation - DSC - VII
5	CSG302	Cloud Computing - DSC - VIII
6	CSE107	Gradle for Android and Java (Industry Partner Course - V)
7	OPUNNN	UE (Open) - III
8	CPU201	Image Management & Technical Skills - UE (C&PD)-II - AECC-III
9	PTG001	Industrial Training - I * - SEC - VI
10	TPG001	Term Paper - SEC -VII
11	MCG005	Student Mentoring & Counselling
12	DPG001	Progression Interview by Dean & HoD

\* from preceding Summer

**Sem-VI (Year-III)**

S.No.	Code	Course Title
1	CSS102	Simulation & Modeling - SE -III
2	CSG151	Relational Database Management System-I - DSC - IX
3	CSG201	Computer Graphics - DSC - X

4	CSG401	Network Security and Cryptography - DSC - XI
5	CSG451	Mobile Application Development
6	CSE108	Android Design for Developers (Industry Partner Course -VI)
7	CSENNN	DSE - VIII
8	HMUNNN	Counselling & Negotiating Skills for Managers- UE (H&M)-III - GE-III
9	SPG001	Technical Seminar - SEC - VIII
10	MCG006	Student Mentoring & Counselling

**Sem-VII (Year-IV)**

S.No.	Code	Course Title
1	CSG152	Relational Database Management System - I I- DSC - XIII
2	CSG453	Natural Language Processing - DSC - XIV
3	CSG102	Unix and Shell Programming - DSC - XV
4	CSE109	Android Computing (Industry Partner Course -VII)
5	OPUNNN	UE (Open) - IV
6	HMUNNN	Leadership & Entrepreneurship - UE (H&M)- IV -GE-IV
7	MNG001	Minor Project - SEC-IX
8	PTG002	Industrial Training - II *
9	MCG007	Student Mentoring & Counselling

\* from preceding Summer

**Sem-VIII (Year-IV)**

S.No.	Code	Course Title
1	MJG001	Major Project & Presentation - SEC - X
2	PNG001	Internship
3	MCG008	Student Mentoring & Counselling
4	DXG001	Dean & HoD's & Guide's Exit Interview

**Total No. of Credits in B.Tech. (Computer Science & Engineering) - 200**

**PLEASE NOTE:**

1. Each Lecture and Tutorial Credit has one Contact hour and Each Practical Credit has two cont
2. UE (H&M) = University Elective (Humanities & Management);

TY

Technology (USET)

Engineering

g)-Android Development (Google)

rs - Eight Semesters

				Category of Course	
L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
2	1	0	3   3	School Core	Foundation Core
3	0	1	4   5	School Core	Foundation Core
2	0	1	3   4	School Core	Foundation Core
2	0	2	4   6	School Core	Foundation Core/SEC
2	0	1	3   4	School Core	Foundation Core
3	0	0	3   3	Dept Elective	DSE
2	0	0	2   2	Univ Elective	Open Elective
2	0	0	2   2	Univ Elective	AECC
0	0	0.5	0.5   1	Essential Comp	Foundation Core
Credits=24.5   Hours=30					
				Category of Course	
L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
2	1	0	3   3	School Core	Foundation Core
3	0	1	4   5	School Core	Foundation Core
2	0	1	3   4	School Core	Foundation Core
3	0	0	3   3	School Core	Foundation Core
2	0	1	3   4	School Core	Foundation Core/SEC
1/ 2	0	2/1	3   5/4	School Core	Foundation Core/SEC
3	0	0	3   3	Dept Elective	DSE
2	0	0	2   2	Univ Elective	Interdisc/Generic Elective
0	0	0.5	0.5   1	Essential Comp	Foundation Core
Credits=24.5   Hours= 30/29					
				Category of Course	
L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
2	1	0	3   3	School Core	Foundation Core
3	0	1	4   5	School Core	Foundation Core
3	0	0	3   3	School Core	Foundation Core
2/1	0	1/2	3   4/5	School Core	AECC
2	0	1	3   4	Dept Core	DSC
2	0	1	3   4	Dept Core	DSC

3	0	0	3   3	Dept Elective   DSE
2	0	0	2   2	Univ Elective   Open Elective
0	0	0	1   1	Essential Comp   SEC
0	0	0.5	0.5   1	Essential Comp   Foundation Core
Credits=25.5   Hours= 30/31				
				<b>Category of Course</b>
L	T	P	Total (C)   (H)	As per RBU   As per UGC-CBCS
2	0	0	2   2	School Core   Foundation Core
2	1	0	3   3	School Core   Foundation Core
3	0	0	3   3	School Elective   Foundation Elective
2	0	1	3   4	Dept Core   DSC
3	0	1	4   5	Dept Core   DSC
3	0	1	4   5	Dept Core   DSC
3	0	0	3   3	Dept Elective   DSE
2	0	0	2   2	Dept Elective   DSE
2	0	0	2   2	Univ Elective   Interdisc/Generic Elective
0	0	0.5	0.5   1	Essential Comp   Foundation Core
Credits=26.5   Hours=30				
				<b>Category of Course</b>
L	T	P	Total (C)   (H)	As per RBU   As per UGC-CBCS
3	1	1	5   6	School Core   Foundation Core
2	0	1	3   4	School Elective   Foundation Elective
2	0	1	3   4	Dept Core   DSC
3	1	0	4   4	Dept Core   DSC
3	0	0	3   3	Dept Core   DSC
3	0	0	3   3	Dept Elective   DSE
2	0	0	2   2	Univ Elective   Open Elective
2	0	0	2   2	Univ Elective   AECC
0	0	0	2   0	Essential Comp   SEC
1	0	0	1   1	Essential Comp   SEC
0	0	0.5	0.5   1	Essential Comp   Foundation Core
0	0	0	1   0	Essential Comp   Foundation Core
Credits=29.5   Hours=30				
				<b>Category of Course</b>
L	T	P	Total (C)   (H)	As per RBU   As per UGC-CBCS
2	1	0	3   3	School Elective   Foundation Elective
3	0	1	4   5	Dept Core   DSC
2	0	1	3   4	Dept Core   DSC

4	0	0	4   4	Dept Core	DSC
3	0	0	3   3	Dept Core	DSC
3	0	0	3   3	Dept Elective	DSE
3	0	0	3   3	Dept Elective	DSE
2	0	0	2   2	Univ Elective	Interdisc/Generic Elective
1	0	0	1   1	Essential Comp	SEC
0	0	0.5	0.5   1	Essential Comp	Foundation Core
Credits=26.5   Hours=29					

				Category of Course	
L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
2	0	1	3   4	Dept Core	DSC
2	1	0	3   3	Dept Core	DSC
2	0	1	3   4	Dept Core	DSC
3	0	0	3   3	Dept Elective	DSE
2	0	0	2   2	Univ Elective	Open Elective
2	0	0	2   2	Univ Elective	Interdisc/Generic Elective
0	0	0	4   4	Essential Comp	SEC
0	0	0	2   0	Essential Comp	SEC
0	0	0.5	0.5   1	Essential Comp	Foundation Core

				Category of Course	
L	T	P	Total (C)   (H)	As per RBU	As per UGC-CBCS
0	0	0	9   8	Essential Comp	SEC
0	0	0	10   0	Essential Comp	SEC
0	0	0.5	0.5   1	Essential Comp	Foundation Core
0	0	0	1   0	Essential Comp	Foundation Core
Credits=20.5   Hours=17					

act hours;




S.No.	Code
1	AMG001
2	ASG001/ASG002
3	EEG001
4	MEG001
5	CSG001
6	CSE117
7	OPUNNN
8	HMU101
9	MCG001

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S.No.	Code
1	AMG002
2	ASG002/ASG001
3	ECG001
4	CEG001
5	ECG401
6	MEG051/HVU100
7	CSE111
8	CPU200
9	MCG002

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S.No.	Code
1	AMG003
2	CEG058
3	MEG052
4	HVU100/MEG051
5	CSG053
6	CSG251
7	CSE112
8	OPUNNN

9	PRG001
10	MCG003

\* from preceding Summer

S.No.	Code
1	CEG060
2	ASG005
3	CSS100
4	CSG301
5	CSG101
6	ECG102
7	CSE137
8	CSENNN
9	HMUNNN
10	MCG004

S.No.	Code
1	CSG002
2	CSS101
3	CSG051
4	CSG252
5	CSG302
6	CSE113
7	OPUNNN
8	CPU201
9	PTG001
10	TPG001
11	MCG005
12	DPG001

\* from preceding Summer

S.No.	Code
1	CSS102
2	CSG151
3	CSG201
4	CSG401
5	CSG451

6	CSE114
7	CSENNN
8	HMUNNN
9	SPG001
10	MCG006

S.No.	Code
1	CSG152
2	CSG453
3	CSG102
4	CSE115
5	OPUNNN
6	HMUNNN
7	MNG001
8	PTG002
9	MCG007

\* from preceding Summer

S.No.	Code
1	MJG001
2	PNG001
3	MCG008
4	DXG001

To

**PLEASE NOTE:**

1. Each Lecture and Tutorial Cr
2. UE (H&M) = University Elect

**RAYAT-BAHRA UNIVERSITY**

University School of Engineering & Technology (USET)

**Department of Computer Science & Engineering**

**Bachelor of Technology (Computer Science & Engineering)-iot on JAVA**

**Course Structure - B.Tech. (CSE) - Four Years - Eight Semesters**

Sem-I (Year-I)				
Course Title	L	T	P	Total (C)   (H)
Applied Math -I	2	1	0	3   3
Applied Physics*/ Industrial Chemistry*	3	0	1	4   5
Basics of Electrical Engineering	2	0	1	3   4
Basics of Mechanical Engineering & Workshop - SEC - I	2	0	2	4   6
Fundamentals of Computers & Languages	2	0	1	3   4
Introduction to SQL ( Industry Partner Course - I)	3	0	0	3   3
UE (Open) - I	2	0	0	2   2
Essentials of Management - UE (H&M) -I - GE - I	2	0	0	2   2
Student Mentoring & Counselling	0	0	0.5	0.5   1
<b>Credits =24.5   Hours=30</b>				

Sem-II (Year-I)				
Course Title	L	T	P	Total (C)   (H)
Applied Math - II	2	1	0	3   3
Industrial Chemistry*/ Applied Physics*	3	0	1	4   5
Basics of Electronics	2	0	1	3   4
Basics of Civil & Environmental Studies	3	0	0	3   3
Instrumentation for Engineers & Scientists - SEC - II	2	0	1	3   4
Engineering Drawing and Practical Geometry - SEC - III/ Human Values and Professional Ethics - AECC - II	1/2	0	2/1	3   5/4
JAVA Fundamentals (Industry Partner Course - II)	3	0	0	3   3
English Communication & Soft Skills - UE (C&PD) - I - AECC -I	2	0	0	2   2
Student Mentoring & Counselling	0	0	0.5	0.5   1
<b>Credits=24.5   Hours= 30/29</b>				

Sem-III (Year-II)				
Course Title	L	T	P	Total (C)   (H)
Applied Math - III	2	1	0	3   3
Materials Science & Engineering	3	0	1	4   5
Engineering Design	3	0	0	3   3
Human Values and Professional Ethics - AECC - II/ Engineering Drawing and Practical Geometry - SEC - III	2/1	0	1/2	3   4/5
Object Oriented Programming - DSC - I	2	0	1	3   4
Data Structures - DSC - II	2	0	1	3   4
JAVA Programming (Industry Partner Course - III)	3	0	0	3   3
UE(Open) - II	2	0	0	2   2

Industrial Tour* - SEC - IV	0	0	0	1   1
Student Mentoring & Counselling	0	0	0.5	0.5   1
<b>Credits=25.5   Hours= 30/31</b>				

#### Sem-IV (Year-II)

Course Title	L	T	P	Total (C)   (H)
Nanomaterials & Nanotechnology	2	0	0	2   2
Statistical Analysis & Techniques - Sec - V	2	1	0	3   3
Functional Materials in Computer Engineering - SE - I	3	0	0	3   3
Data Communication & Computer Networks DSC - III	2	0	1	3   4
Operating System DSC - IV	3	0	1	4   5
Microprocessor and Programming DSC - V	3	0	1	4   5
Object Oriented Analysis and Design Using UML (Industry Partner Course - IV)	3	0	0	3   3
DSE - V	2	0	0	2   2
Strategic Management - UE (H&M)-II - GE-II	2	0	0	2   2
Student Mentoring & Counselling	0	0	0.5	0.5   1
<b>Credits=26.5   Hours=30</b>				

#### Sem-V (Year-III)

Course Title	L	T	P	Total (C)   (H)
Weighting & MCDM Techniques	3	1	1	5   6
Discrete Mathematics - SE - II	2	0	1	3   4
Programming in Java - DSC - VI	2	0	1	3   4
Theory of Computation - DSC - VII	3	1	0	4   4
Cloud Computing - DSC - VIII	3	0	0	3   3
Web Application Development (Industry Partner Course - V)	3	0	0	3   3
UE (Open) - III	2	0	0	2   2
Image Management & Technical Skills - UE (C&PD)-II - AECC-III	2	0	0	2   2
Industrial Training - I * - SEC - VI	0	0	0	2   0
Term Paper - SEC -VII	1	0	0	1   1
Student Mentoring & Counselling	0	0	0.5	0.5   1
Progression Interview by Dean & HoD	0	0	0	1   0
<b>Credits=29.5   Hours=30</b>				

#### Sem-VI (Year-III)

Course Title	L	T	P	Total (C)   (H)
Simulation & Modeling - SE -III	2	1	0	3   3
Relational Database Management System-I - DSC - IX	3	0	1	4   5
Computer Graphics - DSC - X	2	0	1	3   4
Network Security and Cryptography - DSC - XI	4	0	0	4   4
Mobile Application Development	3	0	0	3   3

Mobile Application Development (Industry Partner Course -VI)	3	0	0	3   3
DSE - VIII	3	0	0	3   3
Counselling & Negotiating Skills for Managers- UE (H&M)-III - GE-III	2	0	0	2   2
Technical Seminar - SEC - VIII	1	0	0	1   1
Student Mentoring & Counselling	0	0	0.5	0.5   1

Credits=26.5 | Hours=29

<b>Sem-VII (Year-IV)</b>
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Course Title	L	T	P	Total (C)   (H)
Relational Database Management System - I I- DSC - XIII	2	0	1	3   4
Natural Language Processing - DSC - XIV	2	1	0	3   3
Unix and Shell Programming - DSC - XV	2	0	1	3   4
Embedded Application Development (Industry Partner Course -VII)	3	0	0	3   3
UE (Open) - IV	2	0	0	2   2
Leadership & Entrepreneurship - UE (H&M)- IV -GE-IV	2	0	0	2   2
Minor Project - SEC-IX	0	0	0	4   4
Industrial Training - II *	0	0	0	2   0
Student Mentoring & Counselling	0	0	0.5	0.5   1

Credits=22.5 | Hours=23

<b>Sem-VIII (Year-IV)</b>
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Course Title	L	T	P	Total (C)   (H)
Major Project & Presentation - SEC - X	0	0	0	9   8
Internship	0	0	0	10   0
Student Mentoring & Counselling	0	0	0.5	0.5   1
Dean & HoD's & Guide's Exit Interview	0	0	0	1   0

Credits=20.5 | Hours=17

**Total No. of Credits in B.Tech. (Computer Science & Engineering) - 200**

edit has one Contact hour and Each Practical Credit has two contact hours;  
 tive (Humanities & Management);



Essential Comp   SEC
Essential Comp   Foundation Core
<b>Category of Course</b>
As per RBU   As per UGC-CBCS
School Core   Foundation Core
School Core   Foundation Core
School Elective   Foundation Elective
Dept Core   DSC
Dept Core   DSC
Dept Core   DSC
Dept Elective   DSE
Dept Elective   DSE
Univ Elective   Interdisc/Generic Elective
Essential Comp   Foundation Core
<b>Category of Course</b>
As per RBU   As per UGC-CBCS
School Core   Foundation Core
School Elective   Foundation Elective
Dept Core   DSC
Dept Core   DSC
Dept Core   DSC
Dept Elective   DSE
Univ Elective   Open Elective
Univ Elective   AECC
Essential Comp   SEC
Essential Comp   SEC
Essential Comp   Foundation Core
Essential Comp   Foundation Core
<b>Category of Course</b>
As per RBU   As per UGC-CBCS
School Elective   Foundation Elective
Dept Core   DSC
Dept Core   DSC
Dept Core   DSC
Dept Core   DSC



Dept Elective   DSE
Dept Elective   DSE
Univ Elective   Interdisc/Generic Elective
Essential Comp   SEC
Essential Comp   Foundation Core
<b>Category of Course</b>
As per RBU   As per UGC-CBCS
Dept Core   DSC
Dept Core   DSC
Dept Core   DSC
Dept Elective   DSE
Univ Elective   Open Elective
Univ Elective   Interdisc/Generic Elective
Essential Comp   SEC
Essential Comp   SEC
Essential Comp   Foundation Core
<b>Category of Course</b>
As per RBU   As per UGC-CBCS
Essential Comp   SEC
Essential Comp   SEC
Essential Comp   Foundation Core
Essential Comp   Foundation Core

RAYAT-BAHRA UNIVERSITY					
University School of Engineering & Technology (USET)					
Department of Computer Science & Engineering					
B.Tech. (CSE)					
DEPARTMENT ELECTIVES					
For Base Programme: (DSE-I-to-DSE-XII) & For Industry Partnered Programmes (DSE-V, DSE-VIII, DSE-X, DSE-XI)					
Code	Specialisations	DSE-I	DSE-II	DSE-III	DSE-IV
	Base Programme	(CSE101) Open Source Softwares	(CSE102) Introduction to Web Designing	(CSE124) Computer Architecture & Organization	(CSE122) Data Analysis & Algorithms
		(CSE125) Computer Peripheral & Interfaces	(CSE110) Introduction to Programming Languages	(ECE004) Digital Electronics	(CSE116) System Programming
		DSE-V	DSE-VI	DSE-VII	DSE-VIII
		(CSE120) Multimedia Systems	(CSE129) Information Security	(CSE140) Software Testing & Quality Assurance	(CSE103) Artificial Intelligence & Neural Networks
		(CSE138) Software Engineering			(CSE121) Image Processing
		(CSE130) Biometric Security	(CSE123) Advanced Computer Networks	(CSE139) Unified Modeling Language	(CSE118) Data Mining
		(CSE136) Management Information System			(CSE135) Soft Computing
		DSE-IX			
		(CSE131) Cyber Security			
		(CSE158) Distributed Databases			
For Industry Partnered Programmes (DSE-I, DSE-II, DSE-III, DSE-IV, DSE-VI, DSE-VII, DSE-IX)					
*Students that opted for Android Development Specilization must opt for these DSEs					
	Android Development (Google)	(CSE100) Fundamentals of Android Development for Beginners - DSE-I	(CSE104) Developing Android Applications - DSE-II	(CSE105) Advanced Android App Development - DSE-III	(CSE106) Google Play Services - DSE-IV
		(CSE107) Gradle for Android and Java - DSE-VI	(CSE108) Android Design for Developers - DSE-VII	(CSE109) Android Computing - DSE-IX	
*Students that opted for IOT on JAVA Specilization must opt for these DSEs					
	IOT on JAVA (Oracle University)	(CSE117) Introduction to SQL - DSE-I	(CSE111) JAVA Fundamentals - DSE-II	(CSE112) JAVA Programming - DSE-III	(CSE137) Object Oriented Analysis and Design Using UML - DSE-IV
		(CSE113) Web Application Development - DSE-VI	(CSE114) Mobile Application Development - DSE-VII	(CSE115) Embedded Application Development - DSE-IX	

## CSE (Inurture)

SEMESTER 1						
Sr. No.	Code	Subjects	Lecture	Tutorial	Practical	Credits
1	ENG451	Technical English	3	0	0	3
2	AMG451	Matrices and Calculus	3	1	0	4
3	ASG451	Applied Physics	3	0	2	4
4	ASG452	Industrial Chemistry	3	0	2	4
5	CSG305	Computer fundamentals & organization	3	0	0	3
6	CSG052	Programming in C	3	1	4	6
7	CPU001	Introduction to Public speaking	0	0	2	1
			18	2	10	25
<b>Contact Hours</b>			<b>30</b>			

SEMESTER 2						
Sr. No.	Code	Subjects	Lecture	Tutorial	Practical	Credits
1	ENG452	Introduction to Communication Skills	2	0	2	3
2	AMG452	Differential Equations and Complex Analysis	3	0	0	3
3	CSG056	OOPS with C++	3	1	4	6
4	CSG109	Operating System Building Blocks	3	0	0	3
5	CSG402	Information Security – I	3	0	4	5
6	CSG057	Introduction to Web Technology	3	0	2	4
7	CPU002	Reasoning and Thinking -I	0	0	2	1
			17	1	14	25
<b>Contact Hours</b>			<b>32</b>			

SEMESTER 3						
Sr. No.	Code	Subjects	Lecture	Tutorial	Practical	Credits
1	AMG453	Fourier Series and Transforms	3	0	0	3
2	CSG404	OSI layer & Security Protocols	3	0	0	3
3	CSG412	Network Security Basics	4	0	4	6
4	CSG253	Data structures using C	3	0	2	4
5	CSG303	Computer Networks	3	0	2	4
6	CSG108	Designing Enterprise Networks	3	0	2	4
7	CPU003	Reasoning and Thinking –II	0	0	2	1
			19	0	12	25
<b>Contact Hours</b>			<b>31</b>			

SEMESTER 4						
Sr. No.	Code No.	Subjects	Lecture	Tutorial	Practical	Credits
1	AMG454	Probability and Queuing Theory	3	0	0	3
2	CSG304	Introduction to Cloud Technology	3	0	0	3
3	CSG103	Introduction to Linux	3	0	4	5
4	CSG403	Information Security – II	3	0	0	3
5	CSG105	Installation and Configuration of Server	3	0	4	5
6	CSG153	Relational Database Management System	3	0	2	4
7	CPU004	Professional Skills	0	0	2	1
			18	0	12	24
<b>Contact Hours</b>			<b>30</b>			

SEMESTER 5						
Sr. No.	Code	Subject	Lecture	Tutorial	Practical	Credits
1	CSG452	Principles of Virtualization	4	0	4	6
2	CSG155	Fundamentals of Datacenter	3	0	0	3
3	CSG405	Cryptography Fundamentals	3	0	0	3
4	CSG154	Fundamentals of Storage	3	0	0	3
5	CSG406	Ethical Hacking Fundamentals	3	0	4	5
6	CSG502	Disaster Recovery and Business Continuity Management	3	0	0	3
7	CPU005	Employability Skills- I	0	0	2	1
8	MNG001	Mini Project	0	0	2	1
9	PTG001	Industrial Training	-	-	-	2
			19	0	12	27
<b>Contact Hours</b>			<b>31</b>			

<b>SEMESTER 6</b>						
<b>Sr. No.</b>	<b>Code</b>	<b>Subjects</b>	<b>Lecture</b>	<b>Tutorial</b>	<b>Practical</b>	<b>Credits</b>
1	CSG104	Introduction to Cloud Computing Solutions	3	0	4	5
2	CSG106	Linux Server Administration	3	0	4	5
3	CSG407	IT Governance, Risk & Information Security Management	3	0	0	3
4	CSG408	Cyber Forensics Basics	3	0	4	5
5	CSG003	Fundamentals of Exchange Server	3	0	0	3
6	CSGNNN	Elective I	3	0	0	3
7	CPU006	Employability Skills – II	0	0	2	1
			18	0	14	<b>25</b>
		<b>Contact Hours</b>		<b>32</b>		

<b>SEMESTER 7</b>						
<b>Sr. No.</b>	<b>Code</b>	<b>Subjects</b>	<b>Lecture</b>	<b>Tutorial</b>	<b>Practical</b>	<b>Credits</b>
1	CSG107	Administration of Server	3	0	4	5
2	CSG409	Virtualization and Cloud Security	3	0	0	3
3	CSG410	Security in Wireless, VOIP and Mobile Apps	4	0	0	4
4	CSG411	Android Security	3	0	4	5
5	CSGNNN	Elective II	3	0	0	3
6	CSG004	Fundamentals of IT Infrastructure Library	3	0	0	3
7	MNG002	Mini Project	0	0	2	1
			19	0	10	<b>24</b>
		<b>Contact Hours</b>		<b>29</b>		

<b>SEMESTER 8</b>						
<b>Sr. No.</b>	<b>Code</b>	<b>Subjects</b>	<b>Lecture</b>	<b>Tutorial</b>	<b>Practical</b>	<b>Credits</b>
1	PNG001	Internship/Project	-	-	-	<b>20</b>
			0	0	0	20

#### **DEPARTMENT ELECTIVES**

<b>Abbreviation</b>	<b>Title</b>	
<b>Elective - I</b>	CSE126	OWASP Framework
	CSE127	ISO27001, PCIDSS and HIPAA
	CSE134	Hactivism, Cyber warfare and Cyber Terrorism
<b>Elective -II</b>	CSE128	Introduction to VOIP
	CSE133	Linux Security and Forensics
	CSE141	Advanced Web Technology

**Domains of CSE Department-Graduate**

Sr. No.	Domain	Level	Code	Subject
1	Foundation Courses	Graduate	CSG001	Fundamentals of Computers and Languages
		Graduate	CSG002	Weighting & MCDM Techniques
		Graduate	CSG003	Fundamentals of Exchange Server
		Graduate	CSG004	Fundamentals of IT Infrastructure Library
		Graduate	CSS100	Functional Materials for Computer Engineers
		Graduate	CSS101	Discrete Mathematics
		Graduate	CSE100	Fundamentals of Android Development for Beginners
		Graduate	CSE101	Open Source Softwares
		Graduate	CSE102	Introduction to Web Designing
2	Programming Languages and Application Development	Graduate	CSG051	Programming in Java
		Graduate	CSG052	Programming in C
		Graduate	CSG053	Object Oriented Programming
		Graduate	CSG054	Web Technology
		Graduate	CSG055	Web Technology -I
		Graduate	CSG056	OOPS with C++
		Graduate	CSG057	Introduction to Web Technology
		Graduate	CSE103	Mobile Application Development
		Graduate	CSE104	Introduction to Cloud Computing Solutions
		Graduate	CSE105	Advanced Android Application Development
		Graduate	CSE106	Google Play Services
		Graduate	CSE107	Gradle for Android and JAVA
		Graduate	CSE108	Android Design for Developers
		Graduate	CSE109	Android Computing
		Graduate	CSE110	Introduction to Programming Languages
		Graduate	CSE111	JAVA Fundamentals
		Graduate	CSE112	JAVA Programming
		Graduate	CSE113	Web Application Development
		Graduate	CSE114	Mobile Application Development using JAVA
		Graduate	CSE115	Embedded Application Development
3	System Softwares	Graduate	CSG101	Operating System
		Graduate	CSG102	UNIX & Shell Programming
		Graduate	CSG103	Introduction to Linux
		Graduate	CSG104	Introduction to Windows Azure
		Graduate	CSG105	Installation and Configuration of Server
		Graduate	CSG106	Linux Server Administration
		Graduate	CSG107	Administration of Server
		Graduate	CSG108	Designing Enterprise Networks
		Graduate	CSG109	Operating System Building Blocks
		Graduate	CSE116	System Programming
4	Database Systems	Graduate	CSG151	Relational Database Management System-I
		Graduate	CSG152	Relational Database Management System-II
		Graduate	CSG153	Relational Database Management System
		Graduate	CSG154	Fundamentals of Storage
		Graduate	CSG155	Fundamentals of Datacenter
		Graduate	CSE117	Introduction to SQL
		Graduate	CSE118	Data Mining
		Graduate	CSE119	Distributed Databases
5	Multimedia Systems and Applications	Graduate	CSG201	Computer Graphics
		Graduate	CSS102	Simulation & Modeling
		Graduate	CSE120	Multimedia Systems
		Graduate	CSE121	Image Processing
6	Algorithms & Methodologies	Graduate	CSG251	Data Structures
		Graduate	CSG252	Theory of Computation
		Graduate	CSG253	Data structures using C
		Graduate	CSE122	Data Analysis & Algorithms
7	Hardware and Networking	Graduate	CSG301	Data Communication & Computer Networks
		Graduate	CSG302	Cloud Computing
		Graduate	CSG303	Computer Networks
		Graduate	CSG304	Introduction to Cloud Technology
		Graduate	CSG305	Computer fundamentals & organization
		Graduate	CSE123	Advanced Computer Networks
		Graduate	CSE124	Computer Architecture & Organization
		Graduate	CSE125	Computer Peripherals & Interface
		Graduate	CSE126	OWASP Framework
		Graduate	CSE127	ISO27001, PCIDSS and HIPAA
Graduate	CSE128	Introduction to VOIP		

8	Security	Graduate	CSG401	Network Security & Cryptography
		Graduate	CSG402	Information Security-I
		Graduate	CSG403	Information Security-II
		Graduate	CSG404	OSI layer & Security Protocols
		Graduate	CSG405	Cryptography Fundamentals
		Graduate	CSG406	Ethical Hacking Fundamentals
		Graduate	CSG407	IT Governance, Risk and Information Security Audit
		Graduate	CSG408	Cyber Forensics Basics
		Graduate	CSG409	Virtualization and Cloud Security
		Graduate	CSG410	Security in Wireless, VOIP and Mobile Apps
		Graduate	CSG411	Android Security
		Graduate	CSG412	Network Security Basics
		Graduate	CSE129	Information Security
		Graduate	CSE130	Biometric Security
		9	Artificial Intelligence	Graduate
Graduate	CSG452			Principles of Virtualization
Graduate	CSG453			Natural Language Processing
Graduate	CSE135			Soft Computing
10	Management Information System	Graduate	CSG502	Disaster Recovery and Business Continuity Management
		Graduate	CSE136	Management Information System
11	Software Engineering	Graduate	CSE137	Object Oriented Analysis and Design Using UML
		Graduate	CSE138	Software Engineering
		Graduate	CSE139	Unified Modeling Language
		Graduate	CSE140	Software Testing & Quality Assurance