Symbiosis Institute of Technology, Hyderabad
Bachelor of Technology (Computer Science and Engineering)
Programme Structure 2024-28

<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="4">B. Tech (Computer Science and Engineering) is a full-time four-year graduation programme, which aims at transforming a student into a technically sound professional. The syllabus contains courses on basic sciences, technical arts, humanities & liberal arts and professional courses. The mix of these courses has been evolved with an aim to produce professionals who have knowledge not only of Engineering but who are good managers to contribute in a cross-functional team and have human values.
Being a professional programme it ensures a healthy balance between theoretical foundation and practical exposure to the present-day world.
The emphasis is to develop all round personality that would enable the students to take up the challenges of the corporate world and also become responsible citizens of the society.</td></tr>
<tr><td>2.</td><td>DURATION (IN MONTHS)</td><td colspan="4">48 (Full Time)</td></tr>
<tr><td>3.</td><td>INTAKE</td><td colspan="4">30</td></tr>
<tr><td rowspan="2">4.</td><td rowspan="2">RESERVATION</td><td rowspan="2">I.Within the sanctioned intake</td><td>a) SC
(In Percentage)</td><td>b) ST
(In Percentage)</td><td>c) Differently abled
(In Percentage)</td></tr>
<tr><td>15</td><td>7.5</td><td>3</td></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2">II.Over and above the sanctioned intake</td><td colspan="2">a) Kashmiri Migrants
(In Seats)</td><td>b) International Students
(In Percentage)</td></tr>
<tr><td colspan="2">2</td><td>20</td></tr>
<tr><td>5.</td><td>ELIGIBILITY</td><td colspan="4">Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of Chemistry/ Computer Science/Electronics/ Information Technology/Biology/Informatics Practices/ Biotechnology/Technical Vocational subject/ Agriculture/Engineering Graphics/Business Studies /Entrepreneurship. Obtained at least 45% marks (40% marks in case of candidates belonging to reserved category) in the above subjects taken together.
OR
Passed D.Voc. Stream in the same or allied sector. (The University will offer suitable bridge courses such as Mathematics, Physics,</td></tr>
</table>

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		Engineering drawing, etc., for the students coming from diverse backgrounds to prepare Level playing field and desired learning outcomes of the programme). B.Tech. : Lateral Entry Passed Minimum Three-years/ Two-year (Lateral Entry) Diploma examination with at least 45% marks (40% marks in case of candidates belonging to reserved category) in ANY branch of Engineering and Technology. OR Passed B.Sc. Degree from a recognized University as defined by UGC, with atleast 45% marks (40% marks or equivalent grade for Scheduled Caste / Scheduled Tribes) and passed 10+2 examination with Mathematics as a subject. OR Passed B. Voc/3 year D.Voc. Stream in the same allied sector. (The Constituent will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for the students coming from diverse backgrounds to achieve desired learning outcomes of the programme).			
6.	**SELECTION PROCEDURE**	Merit list by valid score of Symbiosis Entrance Test (SITEEE) or Joint Entrance Examination (JEE - Main) or Any State Government Engineering Entrance Examination.			
7.	**MEDIUM OF INSTRUCTION**	English			
8.	**PROGRAMME PATTERN**	Semester			
9.	**COURSE & SPECIALIZATION**	As per Annexure A			
10.	**FEE**		**Academic Fee p.a**	**Institute Deposit**	**Total**

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	Indian Students (Amount in INR)		330000	20000	350000
	International Students	**NRI/ PIO/ OCI Category (Amount in US$)**	6300	275	6575
		Foreign National Category (Amount in US$)	1300	275	1575
Note: For additional optional specialization 'Honours' or 'Minor', an additional fees of Rs. 25000/- will be charged in the third year.					
11.	**ASSESSMENT**	The courses will have 40% Continuous Assessment and 60% Term End [University] examination however, some courses (not more than 30% of the total programme credits) may have 100% Continuous Assessment.			
12.	**STANDARD OF PASSING**	The assessment of the student for each examination is done, based on relative performance. Maximum Grade Point (GP) is 10 corresponding to O (Outstanding). For all courses, a student is required to pass both internal and external examination separately with a minimum Grade Point of 4 corresponding to Grade P. Students securing less than 40% absolute marks in each head of passing will be declared FAIL. The University awards a degree to the student who has achieved a minimum CGPA of 4 out of maximum of 10 CGPA for the programme.			
13.	**AWARD OF DEGREE**	Bachelor of Technology (Computer Science and Engineering) will be awarded at the end of semester 8 examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA.			

14. CLASSIFICATION OF CREDITS

Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Mandatory Non-Credit Course/s	Non-Letter Grade Audit Course/s	Total
Common								
1	20	0	0	0	0	0	As per the student's choice	20
2	19	0	0	0	0	1		19
3	23	1	0	0	0	1		24
4	18	2	0	0	0	1		20
5	21	0	0	0	3	0		24
6	12	10	0	0	3	0		25
7	13	11	0	0	0	0		24
8	14	0	0	0	0	0		14
Total	**140**	**24**	**0**	**0**	**6**	**0**		**170**

This Programme Structure is aligned with the norms laid down by the University and is approved by the Academic Council and Board of Management.
Hereafter changes (if any) which conform to the policy on "Curriculum Development and Review" would be permissible, subject to revision of the Programme Structure, following the specified processes.

Director - Academics

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Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 1													
Generic Core Courses													
TE7680	0707210101	Mathematics-I	BS		2	1	0	0	0	30	45	3	75
TE7694	0707210102	Chemistry	BS		3	0	0	0	0	30	45	3	75
TE7695	0707210103	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
T7540	0707210104	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0707210105	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
TE7286	0707210106	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0707210107	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
T7925	0707210108	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
T6732	0707210109	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
TE7749	0707210110	Software Tools for Computer Science	ES		0	0	2	25	0	0	0	1	25
TE7300	0707210111	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
				Total	**11**	**1**	**16**	**125**	**75**	**135**	**165**	**20**	**500**
Semester : 2													
Generic Core Courses													
TE7681	0707210201	Mathematics II	BS		3	1	0	0	0	40	60	4	100
TE7684	0707210202	Physics for Computer Engineers	BS		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7687	0707210203	Physics Lab	BS		0	0	2	10	15	0	0	1	25
T7383	0707210204	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0707210205	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
TE7288	0707210206	Programming in C	PC		3	0	0	0	0	30	45	3	75
TE7289	0707210207	Programming in C Lab	PC		0	0	2	10	15	0	0	1	25
T6873	0707210208	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TE7689	0707210209	Statistics and Probability	BS		2	1	0	0	0	30	45	3	75
TE7188	0707210210	Environmental Science			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**14**	**2**	**6**	**30**	**45**	**175**	**225**	**19**	**475**
Semester : 3													
Generic Core Courses													
TE7675	0707210301	Discrete Mathematics and Graph Theory	BS		3	1	0	0	0	40	60	4	100
T7996	0707210302	Computer Organization	PC		3	0	0	0	0	30	45	3	75
TE7960	0707210303	Data Structures	PC		3	0	0	0	0	30	45	3	75
TE7959	0707210304	Data Structures Lab	PC		0	0	2	10	15	0	0	1	25
T7512	0707210305	Programming Paradigms	PC		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7513	0707210306	Programming Paradigms Lab	PC		0	0	2	10	15	0	0	1	25
TE7745	0707210307	Sensors and Microcontrollers	ES		3	0	0	0	0	30	45	3	75
TE7746	0707210308	Sensors and Microcontrollers Lab	ES		0	0	2	10	15	0	0	1	25
T2646	0707210309	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
F0003	0707210310	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TH4788	0707210311	Health and Wellness Module I	0		0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**19**	**1**	**6**	**30**	**45**	**260**	**240**	**23**	**575**
Generic Elective Courses Group (Choose Any One Course)													
T6872	0707210312	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	0707210313	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
				Total Required Credits				**0**	**0**	**25**	**0**	**1**	**25**
Semester : 4													
Generic Core Courses													
TE7170	0707210401	Engineering Mathematics-III	BS		2	1	0	0	0	30	45	3	75
F0004	0707210402	Flexi-Credit Course	PC		4	0	0	0	0	100	0	4	100
T7907	0707210403	Database Management Systems	PC		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7487	0707210404	Data Base Management Systems Lab	PC		0	0	4	20	30	0	0	2	50
T7510	0707210405	Operating Systems	PC		3	0	0	0	0	30	45	3	75
T7511	0707210406	Operating Systems Lab	PC		0	0	2	10	15	0	0	1	25
TE7290	0707210407	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
TH4789	0707210408	Health and Wellness Module II	0		0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**12**	**1**	**10**	**80**	**45**	**190**	**135**	**18**	**450**
Generic Elective Courses Group (Choose Any One Course)													
T6184	0707210409	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0707210410	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	0707210411	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
				Total Required Credits				**0**	**0**	**50**	**0**	**2**	**50**
Semester : 5													
Generic Core Courses													
F0004	0707210501	Flexi-Credit Course	PC		4	0	0	0	0	100	0	4	100
T8000	0707210502	Service Learning	HS		0	0	8	100	0	0	0	4	100
T7908	0707210503	Computer Networks	PC		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7482	0707210504	Computer Networks Lab	PC		0	0	2	10	15	0	0	1	25
T7909	0707210505	Design and Analysis of Algorithms	PC		3	0	0	0	0	30	45	3	75
T7491	0707210506	Design and Analysis of Algorithms Lab	PC		0	0	2	10	15	0	0	1	25
TE7299	0707210507	Theory of Computation	PC		3	0	0	0	0	30	45	3	75
T6774	0707210508	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
				Total	**15**	**0**	**12**	**120**	**30**	**240**	**135**	**21**	**525**
Open Elective Courses Group (Choose Any One Course)													
TE7677	0707210509	Financial Mathematics	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7700	0707210510	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7223	0707210511	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	0707210512	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
T7499	0707210513	Java	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
TE7952	0707210514	User Interface and Experience Design	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
TEE7018	0707210515	Engineering Simulation and Modeling Tools	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7428	0707210516	Introduction to Image Processing	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7810	0707210517	Industrial Revolution and Introduction of Industry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	0707210518	Six sigma	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7948	0707210519	Introduction to Cloud Computing	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 6													
Generic Core Courses													
TE7008	0707210601	Distributed Systems and Resource Management	PC		3	0	0	0	0	30	45	3	75
F0003	0707210602	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
T6749	0707210603	Design Thinking	HS		2	0	0	0	0	50	0	2	50
TE7291	0707210604	Project Based Learning-II	PIS		0	0	4	50	0	0	0	2	50
T7802	0707210605	Capstone Course	PC		2	0	0	0	0	50	0	2	50
Total					**10**	**0**	**4**	**50**	**0**	**205**	**45**	**12**	**300**
Open Elective Courses Group													
TE7698	0707210620	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7676	0707210621	Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	0707210622	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	0707210623	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7297	0707210624	Software Testing Tools	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
TE7756	0707210625	Open Source Technologies	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
T7584	0707210626	Printed Circuit Board (PCB) Design	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7334	0707210627	Introduction to Mechatronics	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7804	0707210628	Design Optimization Techniques	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	0707210629	3D Printing and Prototyping	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - I (Choose any one Group from Group A to C)													
Generic Elective Courses Group - A													
TE7255	0707210606	Data Warehousing and Mining	PE		3	0	0	0	0	30	45	3	75
TE7013	0707210607	Data Warehousing and Mining Lab	PE		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - B													
TE7101	0707210608	Internet of Things	PE		3	0	0	0	0	30	45	3	75
TE7262	0707210609	Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - C													
TE7916	0707210610	Cloud Computing Tools and Techniques	PE		3	0	0	0	0	30	45	3	75
TE7949	0707210611	Cloud Computing Tools and Techniques Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - II (Choose any one Group from Group D to F)													
Generic Elective Courses Group - D													
T7473	0707210612	Artificial Intelligence	PE		3	0	0	0	0	30	45	3	75
TE7014	0707210613	Artificial Intelligence Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - E													
TE7328	0707210614	Image Processing	PE		3	0	0	0	0	30	45	3	75
TE7329	0707210615	Image Processing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Generic Elective Courses Group - F													
TE7953	0707210616	Information and Network Security	PE		3	0	0	0	0	30	45	3	75
TE7947	0707210617	Information and Network Security Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits				**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - III (Choose any one Course)													
T2585	0707210618	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
TE7438	0707210619	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50
				Total Required Credits				**0**	**0**	**50**	**0**	**2**	**50**
Semester : 7													
Generic Core Courses													
T7804	0707210701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
TE7751	0707210702	Compiler Construction	PC		3	0	0	0	0	30	45	3	75
T7478	0707210703	Compiler Construction Lab	PC		0	0	2	10	15	0	0	1	25
F0003	0707210704	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
T7674	0707210705	Cyber Security	PC		2	0	0	0	0	20	30	2	50
				Total	**8**	**0**	**10**	**50**	**75**	**125**	**75**	**13**	**325**
Generic Elective Courses Group - I (Choose any one Group from Group A to D)													
Generic Elective Courses Group - A													

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7253	0707210706	Data Science	PE		3	0	0	0	0	30	45	3	75
TE7254	0707210707	Data Science Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - B													
TE7261	0707210708	Internet of Things	PE		3	0	0	0	0	30	45	3	75
TE7262	0707210709	Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - C													
TE7282	0707210710	Optimization Techniques and Algorithms	PE		3	0	0	0	0	30	45	3	75
TE7283	0707210711	Optimization Techniques and Algorithms Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - D													
TE7552	0707210712	Big Data Analytics	PE		3	0	0	30	45	0	0	3	75
TE7554	0707210713	Big Data Analytics Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**40**	**60**	**0**	**0**	**4**	**100**
Generic Elective Courses Group - II (Choose any one Group from Group E to G)													
Generic Elective Course Group - E													
T7529	0707210714	Machine Learning	PE		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7105	0707210715	Machine Learning Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - F													
TE7103	0707210716	Natural Language Processing	PE		3	0	0	0	0	30	45	3	75
TE7106	0707210717	Natural Language Processing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - G													
TE7951	0707210718	DevOps	PE		2	0	0	0	0	20	30	2	50
TE7950	0707210719	DevOps Lab	PE		0	0	4	20	30	0	0	2	50
Total Required Credits								**20**	**30**	**20**	**30**	**4**	**100**
Generic Elective Courses Group - III (Choose any One Course)													
TE7955	0707210720	Introduction to AR/VR	PE		3	0	0	0	0	30	45	3	75
TE7259	0707210721	Human Computer Interface	PE		3	0	0	0	0	30	45	3	75
TE7954	0707210722	Introduction to Information Retrieval	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 8													
Generic Core Courses													

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Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7912	0707210801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	0707210802	Seminar	PIS		0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**28**	**140**	**210**	**0**	**0**	**14**	**350**

Abbreviations (Nature)

BS Basic Sciences
ES Engineering Sciences
HS Humanities and Social Sciences
OE Open Electives
PC Professional Core
PE Professional Elective
PIS Project, Internship, Seminar
PD Professional Development Course
MC Mandatory Course
L Lecture
T Tutorial
CA Continuous Assessment
ESE End Semester Examination
GE Generic Elective

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Annexure A

Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Semester 1	4	16	20	500
Semester 2	1	18	19	475
Semester 3	5	19	24	600
Semester 4	8	12	20	500
Semester 5	10	14	24	600
Semester 6	11	14	25	625
Semester 7	3	21	24	600
Semester 8	0	14	14	350
Total	**42**	**128**	**170**	**4250**