



## Department of Computer Applications

### Structure for 4 years BCA Program

#### 1<sup>st</sup> Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-CC-UMA-T11101	Basic Mathematics I	3	0	0	3
TIU-SEC-UCA-T11101	Problem Solving Techniques using C	3	0	0	3
TIU-CC-UCA-T11101	Computer fundamentals & Digital Electronics	2	0	0	2
TIU-AEC-UEN-S11102	General English-1	1	1	0	2
TIU-MDE-ULL-T11101	Indian Constitution	3	0	0	3
TIU-VAC-UOG-T11101	Environmental Science and Sustainability	2	0	0	2
<b>Practical</b>					
TIU-SEC-UCA-L11101	Problem Solving Techniques using C Lab	0	0	3	1.5
TIU-CC-UCA-L11103	PC Tools and their Applications	0	0	2	1
TIU-CC-UCA-L11101	Computer fundamentals & Digital Electronics Lab	0	0	3	1.5
<b>Sessional</b>					
TIU-AEC-UEN-S11101x	Hindi/Bengali/French (Language Other than Mother Tongue) [Optional Course]	2	0	0	0
<b>Education</b>					
TIU-SEC-UCA-S11101	Entrepreneurship Skill Development - I	0	0	0	2
<b>Total Credits</b>					<b>21</b>



## 2<sup>nd</sup> Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-CC-UMA-T12101	Basic Mathematics II	3	0	0	3
TIU-CC-UCA-T12101	Data Structures Through C	3	0	0	3
TIU-CC-UCA-T12102	Computer Organization & Architecture	3	0	0	3
TIU-CC-UCA-T12103	Operating Systems	3	0	0	3
TIU-SEC-UCA-T12101	OOP Using Java	3	0	0	3
TIU-VAC-UED-T12101	Indian Knowledge System	2	0	0	2
<b>Practical</b>					
TIU-CC-UCA-L12101	Data Structures Through C LAB	0	0	3	1.5
TIU-CC-UCA-L12103	Operating Systems LAB	0	0	3	1.5
TIU-SEC-UCA-L12101	OOP Using Java LAB	0	0	3	1.5
TIU-SEC-UCA-L12102	Web Technology Lab	0	0	3	1.5
<b>Education</b>					
TIU-SEC-UES-S12101	Entrepreneurship Skill Development	0	0	0	1
<b>Total Credits</b>					<b>24</b>



## 3<sup>rd</sup> Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-CC-UCA-T201	Probability and Statistics	3	0	0	3
TIU-CC-UCA-T202	Data Base Management Systems	3	0	4	5
TIU-SEC-UCA-T201	Python Programming	2	0	4	4
TIU-CC-UCA-T203	Software Engineering	3	0	0	3
TIU-DSE-UCA-T201	Professional Elective-1[Basics of Data Analytics using Spreadsheet(Data Science)/ Feature Engineering using Python(AI & ML)]	1	0	4	3
TIU-VAC-UCA-L201	Yoga/Sports/NCC/NSS/Disaster Management	0	0	4	2
TIU-AEC-UCA-T102	Hindi/Bengali/French(Language Other than Mother Tongue) [Optional Course]	2	1	0	0
<b>Total Credits</b>					<b>20</b>



## 4<sup>th</sup> Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-CC-UCA-T204	Entrepreneurship and Startup Ecosystem	1	1	0	2
TIU-CC-UCA-T205	Computer Networks	3	0	4	5
TIU-CC-UCA-T206	Design and Analysis of Algorithms	3	0	0	3
TIU-CC-UCA-T207	Artificial Intelligence	3	0	4	5
TIU-CC-UCA-T208	Tools and Techniques of R Programming	2		4	4
TIU-DSE-UCA-T202	Professional Elective-2[Data Visualization using Excel, R and Python (Data Science)/ Introduction to ML using R(AI & ML)]	1	0	4	3
TIU-VAC-UCA-S201	Yoga/Sports/NCC/NSS/Disaster Management	0	0	4	2
TIU-AEC-UCA-S102	Hindi/Bengali/French(Language Other than Mother Tongue) [Optional Course]	2	1	0	0
<b>Total Credits</b>					<b>24</b>

\*At the end of the Fourth Semester, every student shall undergo Summer Training /Internship through an EDUSKILL Course or otherwise /Capstone for eight weeks in the industry/Research or Academic Institute. This component will be evaluated during the fifth semester.

\*\* An **UNDERGRADUATE DEPLOMA IN COMPUTER APPLICATION** will be awarded, if a student wishes to exit at the end of second year.



## 5<sup>th</sup> Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-DSE-UCA-T301	Professional Elective-III (Introduction to Data Science through R/ Neural Network through R)	3	0	4	5
TIU-DSE-UCA-T302	Professional Elective-IV(Time Series Analysis through R/ Digital Image Processing through R)	3	0	4	5
TIU-DSE-UCA-T303	Professional Elective-V(Exploratory Data Analysis Through R/ Natural Language Processing through R)	3	0	4	5
TIU-SEC-UCA-T301	Quantitative Techniques	0	2	0	2
TIU-SEC-UCA-P302	Internship/Capstone Project	0	0	8	4
TIU-SEC-UCA-P303	Major Project Initiation and Presentation	1	0	2	2
<b>Total Credits</b>					<b>23</b>



## 6<sup>th</sup> Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-CC-UCA-T301	Generative AI	2	0	4	4
TIU-DSE-UCA-T304	Professional Elective-VI(Machine Learning through R/ Deep Learning through R for Computer Vision)	3	0	4	5
TIU-DSE-UCA-T305	Professional Elective-VII(Big Data Analytics Through R/ Predictive Analysis through R)	3	0	4	5
TIU-AEC-UCA-S301	Soft Skills	0	1	0	1
TIU-SEC-UCA-P302	Internship/Capstone Project	0	0	8	4
TIU-SEC-UCA-P303	Major Project Final Presentation(Initiated in 5 <sup>th</sup> Semester)	0	0	8	4
<b>Total Credits</b>					<b>23</b>



## 7<sup>th</sup> Semester

BACHELOR OF COMPUTER APPLICATION (BCA) Degree will be awarded, if a student wishes to exit at the end of third year. Minimum eligibility criteria for opting the course in the fourth year will be as follows:

1. BCA (Honours with Research): BCA Degree
2. BCA (Honours): BCA Degree

### **7th Semester BCA (Honours) Specialization-AI & ML**

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-MDE-UCA-T41101	Social Network Analysis	2	1	0	3
TIU-MDE-UCA-L41101	Social Network Analysis LAB	0	0	3	1.5
TIU-CC-UCA-T41101	Optimization of ML	3	0	0	3
TIU-CC-UCA-L41101	Optimization of ML LAB	0	0	3	1.5
TIU-DSE-UCA-E41101A	Professional Elective-VIII(Speech Recognition through R/ Evolutionary Algorithm through R)	3	0	0	3
TIU-DSE-UCA-L41101A	Professional Elective-VIII(Speech Recognition through R/ Evolutionary Algorithm through R) LAB	0	0	3	1.5
TIU-DSE-UCA-E41102A	Professional Elective-IX(Augmented Reality &Virtual Reality through Python/ Security aspects of ML through Python)	2	1	0	3
TIU-DSE-UCA-L41102A	Professional Elective-IX(Augmented Reality &Virtual Reality through Python/ Security aspects of ML through Python) LAB	0	0	3	1.5
TIU-SEC-UES-S41101	ESD	0	0	3	1.5
TIU-AEC-UCA-S41101	CASD(Project on Data Science)	0	0	3	1.5
	Dissertation Work [Evaluation in Semester eight]	-	-	-	-
TIU-SEC-UCA-S41101	Summer Internship II	0	0	8	4
<b>Total Credits</b>					<b>25</b>



## 7<sup>th</sup> Semester BCA (Honours) Specialization-Data Science

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-MDE-UCA-T41101	Social Network Analysis	2	1	0	3
	Social Network Analysis LAB	0	0	3	1.5
TIU-CC-UCA-T41101	Optimization of ML	3	0	0	3
TIU-CC-UCA-L41101	Optimization of ML LAB	0	0	3	1.5
TIU-DSE-UCA-E41101A	Professional Elective-VIII(Speech Recognition through R/ Evolutionary Algorithm through R)	3	0	0	3
TIU-DSE-UCA-L41101A	Professional Elective-VIII(Speech Recognition through R/ Evolutionary Algorithm through R)LAB	0	0	3	1.5
TIU-DSE-UCA-E41102B	Professional Elective-IX(Business Intelligence &Analytics through Python/ Explainable AI through Python)	3	0	0	3
TIU-DSE-UCA-L41102B	Professional Elective-IX(Business Intelligence &Analytics through Python/ Explainable AI through Python) LAB	0	0	3	1.5
	Dissertation Work [Evaluation in Semester eight]	3	0	0	3
TIU-SEC-UCA-S41101	Summer Internship II	0	0	8	4
<b>Total Credits</b>					<b>25</b>

**7<sup>th</sup> Semester BCA (Honours with Research)**

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-CC-UCA-T41102	Advanced Data Analysis Tools	0	2	0	2
TIU-CC-UCA-L41102	Advanced Data Analysis Tools LAB	0	0	3	1.5
TIU-CC-UCA-T41103	Research Methodology	2	2	0	4
TIU-CC-UCA-I41101	Research Internship Report and Viva Voce	0	0	20	10
TIU-DSE-UCA-E41102C	Professional Elective-VIII (Cloud Computing for Data Analytics /Block Chain Technology)	2	1	0	3
TIU-DSE-UCA-E41103A	Professional Elective-IX (Data Mining & Ware housing through R/Machine Learning Algorithms and their applications)	2	1	0	3
TIU-DSE-UCA-L41103A	Professional Elective-IX-LAB (Data Mining & Ware housing through R LAB/Machine Learning Algorithms and their applications LAB)	0	0	3	1.5
<b>Total Credits</b>					<b>25</b>



## 8<sup>th</sup> Semester

### BCA (Honours)

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
<b>Theory</b>					
TIU-DSE-UCA-E42101A	Professional Elective-X (Cyber Security and Ethical Hacking /Software Project Management)	0	2	4	4
TIU-DSE-UCA-E42102A	Professional Elective-XI(Advanced Java/Dot NET)	2	2	0	4
TIU-DSE-UCA-E42103A	Professional Elective-XII(App Development using R/App Development using Python)	0	0	8	4
TIU-SEC-UCA-D42101	Dissertation Work	0	0	16	8
<b>Total Credits</b>					<b>20</b>

### BCA (Honours) with Research

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
TIU-SEC-UCA-D42102	Dissertation [For Research Track]				<b>20</b>
<b>Total Credits</b>					<b>20</b>