Department of Computer Science and Business Systems

KOLHAPUR INSTITUTE OF TECHNOLOGY'S

COLLEGE OF ENGINEERING

(EMPOWERED AUTONOMOUS)

Gokul Shirgaon, Kolhapur

KOLHAPUR INSTITUTE
OF TECHNOLOGY'S
COLLEGE OF
ENGINEERING
KOLHAPUR
(EMPOWERED AUTONOMOUS)

Curriculum Structure

For

Bachelor of Technology (B.Tech) in

Computer Science and Business Systems

(Undergraduate Programme)

w.e.f

Academic Year 2023-24

Kolhapur Institute of Technology's College of Engineering (Autonomous) Kolhapur
Computer Science Business Systems

About the Department

Computer Science and Business Systems is a blend of Computer Science and Management and covers many emerging topics in the field of computing. The course structure is built with the aim to impart certain knowledge and skill sets to the students and develop certain attitudes and behaviours among the students to make them successful in the era of Business 4.0. After completion of the programme students will be more industry ready and employable engineers who can drive innovation and add value to the organization they work for as well as to the nation in the era of Business 4.0.

Department Vision

To be the centre of excellence to produce competent engineers with necessary technical, managerial and soft skills appropriate to the dynamics of industry and society.

Department Mission

M1:	To inculcate students with the cutting-edge tools and technologies related to information technology, business systems and humanities.
M2:	To provide opportunities to the faculty to upgrade themselves with the latest tools, technologies with collaborative research, consultancy and faculty development programs.
M3:	To instil students with the knowledge and skills necessary to pursue lifelong learning and to contribute ethically to a diverse community.

Programme Educational Objectives (PEO)

PEO1:	Graduates will be able to cultivate the skills required to synchronize themselves with the ever-changing industry requirements and expectations.
PEO2:	Graduates will be able to display managerial/leadership skills acquainted through the management courses.
PEO3:	Graduates will be able to exhibit the technical skills required to solve the real-world problems using the competencies acquired through core computer science courses.
PEO4:	Graduates will be able to demonstrate teamwork, communication, presentation, design, research and ethical attitude skills.

PROGRAMME OUTCOMES (PO)	
PO1:	**Engineering knowledge**: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO2:	**Problem analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO3:	**Design/development of solutions**: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO4:	**Conduct investigations of complex problems:** Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO5:	**Engineering tool usage:** Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
PO6:	**The engineer and The World:** Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO7:	**Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO8:	**Individual and Collaborative Team work:** Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams
PO9:	**Communication:** Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
PO10:	**Project Management and Finance:** Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO11:	**Life-Long Learning:** Recognize the need for and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

PROGRAMME SPECIFIC OUTCOMES (PSO)	
PSO1:	Ability to apply the state-of-the-art programming languages and software applications in the fields of computer science as well as business systems.
PSO2:	Ability to achieve organization's strategic business goals through adopting appropriate technical and managerial skills.

MAPPING OF PEOS TO POS											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
PEO1	1	2	2		2	2			1	1	2
PEO2			2	1	2	1		2	3	2	3
PEO3	1	2	3		2						
PEO4						2		3	3	3	2

MAPPING OF PEOS TO PSOS		
	PSO1	PSO2
PEO1	2	2
PEO2	2	3
PEO3	3	2
PEO4	2	1

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	Teaching and Evaluation Scheme for First Year Semester-I										
Sr. No.	**Course Code**	**Cluster**	**Course**	**Teaching Scheme**				**Evaluation Scheme**			
				L	**T**	**P**	**Credits**	**Components**	**Max**	**Min Marks for Passing**	
1	UCBPC0101	PC	Fundamentals of Computer Science	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBES0102	ES	Discrete Mathematics	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBES0103	ES	Principles of Electrical Engineering	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
4	UCBBS0104	BS	Physics for computing science	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
5	UCBBS0105	BS	Statistics, Probability and Sampling	3	1	0	4	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
6	UCBHS0106	HSSM	Business Communication & Value Science - I	1	0	0	1	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
7	UCBPC0131	PC	Fundamentals of Computer Science Laboratory	0	0	2	1	ISE	25	10	
								ESE (POE)	50	10	
8	UCBES0132	ES	Principles of Electrical Engineering Laboratory	0	0	2	1	ISE	25	10	
								ESE (POE)	50	10	
9	UCBBS0133	BS	Physics for computing science Laboratory	0	0	2	1	ISE	25	10	
10	UCBHS0134	HSSM	Business Communication & Value Science - I Laboratory	0	0	2	1	ISE	25	10	
12	UCBVS0135	VS	Desktop Publishing	0	0	2	1	ISE	25	10	
13	UCBCC0136	CC	Co Curriculum Course-1	0	0	2	1	ISE	25	10	
			Total	**14**	**1**	**12**	**21**	**Total**	**800**		
	Total Contact Hours =27, Total Credits =21										

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	Teaching and Evaluation Scheme for First Year Semester-II										
Sr. No.	**Course Code**	**Cluster**	**Course**	**Teaching Scheme**				**Evaluation Scheme**			
				L	**T**	**P**	**Credits**	**Components**	**Max**	**Min Marks for Passing**	
1	UCBPC0201	PC	Data Structures and Algorithms	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBES0202	ES	Principles of Electronics	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBBS0203	BS	Linear Algebra	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
4	UCBBS0204	BS	Statistical Methods	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
5	UCBEM0205	EM	Fundamentals of Economics	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
6	UCBAE0206	AE	Business Communication & Value Science – II	1	0	0	1	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
7	UCBIK0207	IK	Indian Environmental Studies	2	0	0	2	ISE	50	20	
8	UCBPC0231	PC	Data Structures and Algorithms Laboratory	0	0	2	1	ISE	25	10	
								ESE (POE)	25	10	
9	UCBES0232	ES	Principles of Electronics Laboratory	0	0	2	1	ISE	25	10	
10	UCBBS0233	BS	Statistical Methods Laboratory	0	0	2	1	ISE	25	10	
11	UCBAE0234	AE	Business Communication & Value Science – II Laboratory	0	0	2	1	ISE	25	10	
12	UCBVS0235	VS	Python Programming Laboratory	0	0	2	1	ISE	25	10	
			Total	**16**	**0**	**10**	**21**	**Total**	**800**		
	Total Contact Hours=26, Total Credits=21										

Exit Option: Award of UG Certificate in Major with 42 credits and an additional 8 credits for exit course

Sr. No	Exit Courses	Exit Courses	Examination Mode	Credits
1	UCBEX0291	Certification Course in Graphics Design	Online Certification from professional bodies	3
2	UCBEX0292	Certification Course in Data Analysis		3
3	UCBEX0293	Certification Course in Python for Data Science		2

Teaching and Evaluation Scheme for Second Year Semester-III											
Sr. No.	**Course Code**	**Cluster**	**Course**	**Teaching Scheme**				**Evaluation Scheme**			
				L	**T**	**P**	**Credits**	**Components**	**Max**	**Min Marks for Pass**	
1	UCBPC0301	PC	Formal Language and Automata Theory	3	1	0	4	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBPC0302	PC	Object Oriented Programming using JAVA	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBBS0303	BS	Computational Statistics	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
4	UCBPC0304	PC	Software Engineering	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
5	UCBEM0305	EM	Fundamentals of Management	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
6	UCBVE0306	VEC	Indian Constitution	2	0	0	2	ISE	50	20	
7	UCBPC0331	PC	Object Oriented Programming using JAVA Laboratory	0	0	2	1	ISE	25	10	
								ESE (POE)	50	20	
8	UCBBS0332	BS	Computational Statistics Lab	0	0	2	1	ISE	25	10	
								ESE (POE)	25	10	
9	UCBPC0333	PC	Software Engineering Laboratory	0	0	2	1	ISE	25	10	
10	UCBIL0371	OJT	Mini-Project-I	0	0	2	1	ISE	25	10	
11	UCBMM0341	MM	Fundamentals of Marketing (MM-I)	2	0	0	2	ESE	100	40	
			Total	**18**	**1**	**08**	**23**	**Total**	**850**		
	Total Contact Hours =27, Total Credits =23										

Teaching and Evaluation Scheme for Second Year Semester-IV											
Sr. No.	**Course Code**	**Cluster**	**Course**	**Teaching Scheme**				**Evaluation Scheme**			
				L	**T**	**P**	**Credits**	**Components**	**Max**	**Min Marks for Pass**	
1	UCBPC0401	PC	Operating Systems	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBPC0402	PC	Database Management System	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBPC0403	PC	Computer Organization & Architecture	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
4	UCBEM0404	EM	Operations Research	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
5	UCBAE0405	AE	Business Communication & Value Science –III	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
6	UCBPC0431	PC	Operating Systems Laboratory	0	0	2	1	ISE	25	10	
								ESE(POE)	50	20	
7	UCBPC0432	PC	Database Management System Laboratory	0	0	2	1	ISE	25	10	
								ESE(POE)	50	20	
8	UCBPC0433	PC	Computer Organization & Architecture Laboratory	0	0	2	1	ISE	25	10	
9	UCBAE0434	AE	Business Communication & Value Science –III Laboratory	0	0	2	1	ISE	25	10	
10	UCBCC0435	CC	Co-Curricular Course-II	0	0	2	1	ISE	25	10	
11	UCBIL0471	OJT	Mini Project-II	0	0	2	1	ISE	25	10	
12	UCBMM0441	MM	Financial and Cost Accounting (MM-II)	3	0	0	3	ESE	100	40	
			Total	**17**	**0**	**12**	**23**	**Total**	**850**		
	Total Contact Hours=29, Total Credits=23										

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Exit Option: Award of UG Certificate in Major with 88 credits and an additional 8 credits for exit course.

Sr. No	Course Code	Exit Courses	Examination Mode	Credits
1	UCBEX0491	Certification course in Data Science	Online Certification	3
2	UCBEX0492	Certification Course in Web Development		3
3	UCBEX0493	Certification Course in NoSQL		2

Value Education Course	
1	Lifestyle for Holistic Health

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Sr. No.	Course Code	Cluster	Course	Teaching Scheme				Evaluation Scheme			
				L	T	P	Credits	Components	Max	Min Marks for Pass	
Teaching and Evaluation Scheme for Third Year Semester-V											
1	UCBPC0501	PC	Design and Analysis of Algorithms	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBPC0502	PC	Compiler Design (LEX & YACC)	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBPE05**	PE	Program Elective-I	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
4	UCBOE05**	OE	Open Elective-I	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
5	UCBAE0503	AE	Business Communication & Value Science – IV	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
6	UCBPC0531	PC	Design and Analysis of Algorithms Laboratory	0	0	2	1	ISE	25	10	
7	UCBPC0532	PC	Compiler Design (LEX & YACC) Laboratory	0	0	2	1	ISE	25	10	
								ESE (POE)	50	20	
8	UCBPC0533	PC	Modern Web Application Laboratory	0	0	2	1	ISE	25	10	
								ESE (POE)	50	20	
9	UCBAE0534	AE	Business Communication & Value Science – IV Laboratory	0	0	2	1	ISE	25	10	
10	UCBVS0535	VS	Certification in Red Hat (Edu skills)	0	0	2	1	ISE	25	10	
11	UCBIL0571	OJT	Mini Project-III	0	0	2	1	ISE	25	10	
12	UCBMM0541	MM	Business Strategies (MM-III)	3	0	0	3	ESE	100	40	
			Total	**17**	**0**	**12**	**23**	**Total**	**850**		
	Total Contact Hours =29, Total Credits =23										

	Teaching and Evaluation Scheme for Third Year Semester-VI										
Sr. No.	**Course Code**	**Cluster**	**Course**	**Teaching Scheme**				**Evaluation Scheme**			
				L	**T**	**P**	**Credits**	**Components**	**Max**	**Min Marks for Pass**	
1	UCBPC0601	PC	Computer Networks	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBPC0602	PC	Machine Learning	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBPC0603	PC	Design Thinking	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
4	UCBEM0604	PC	Information Security	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
5	UCBPE06**	PE	Program Elective II	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
6	UCBOE06**	OE	Open Elective-II	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
7	UCBPC0631	PC	Computer Networks Laboratory	0	0	2	1	ISE	25	10	
8	UCBPC0632	PC	Machine Learning Laboratory	0	0	2	1	ISE	25	10	
								ESE(POE)	25	10	
9	UCBPC0633	PC	Information Security Laboratory	0	0	2	1	ISE	25	10	
10	UCBCC0634	CC	Co-Curricular Course-III	0	0	2	1	ISE	25	10	
11	UCBIL0671	OJT	Mini-Project-IV	0	0	2	1	ISE	25	10	
12	UCBMM0641	MM	Consumer Behaviour (MM-IV)	3	0	0	3	ESE	100	40	
			Total	**19**	**0**	**10**	**24**	**Total**	**850**		
	Total Contact Hours=29, Total Credits=24										

Exit Option: Award of UG Certificate in Major with 135 credits and an additional 8 credits for exit course.

Sr. No	Course Code	Exit Courses	Examination Mode	Credits
1	UCBEX0691	Certification course in AWS	Online Certification	3
2	UCBEX0692	Certification Course in CISA(Certified Information Systems Auditor		3
3	UCBEX0693	Certification Course in Professional Android Developer		2

Program Elective-I		
Sr. No.	**Course Code**	**Course Name**
1	UCBPE0511	Cloud, Microservices & Application
2	UCBPE0512	Artificial Intelligence
3	UCBPE0513	IT Project Management

Program Elective-II		
Sr. No.	**Course Code**	**Course Name**
1	UCBPE0611	Software Design with UML
2	UCBPE0612	Android Application Development
3	UCBPE0613	Financial Management

Open Elective-I		
Sr. No.	**Course Code**	**Course Name**
1	UCBOE0521	Introduction to Data Analytics
2	UCBOE0522	Behavioural Economics
3	UCBOE0523	Cyber Security

Open Elective-II		
Sr. No.	**Course Code**	**Course Name**
1	UCBOE0621	Industry 4.0
2	UCBOE0622	Intellectual Property and Entrepreneurship

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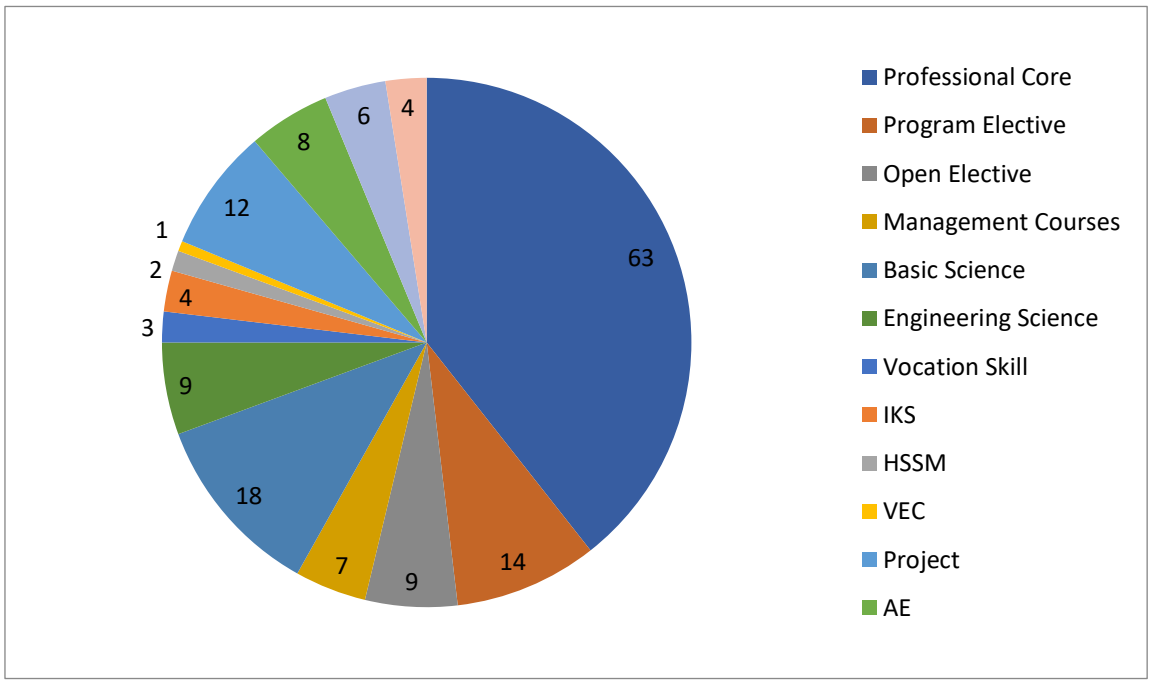
	Teaching and Evaluation Scheme for Final Year Semester-VII										
Sr. No.	**Course Code**	**Course Category**	**Course**	**Teaching Scheme**				**Evaluation Scheme**			
				L	**T**	**P**	**Credits**	**Components**	**Max**	**Min Marks for Pass**	
1	UCBPC0701	PC	Usability Design of Software Applications	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBPC0702	PC	Natural Language Processing	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBPC0703	PC	Software Testing	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
4	UCBPE07**	PE	Program Elective-III	2	0	0	2	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
5	UCBOE07**	OE	Open Elective-III	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
6	UCBPC0731	PC	Natural Language Processing Laboratory	0	0	2	1	ISE	25	10	
								ESE(POE)	50	20	
7	UCBPC0732	PC	Software Testing Laboratory	0	0	2	1	ISE	25	10	
								ESE (POE)	50	20	
8	UCBPE07**	PE	Program Elective-III Laboratory	0	0	2	1	ISE	25	10	
9	UCBIL0771	OJT	Project -I	0	0	8	4	ISE	25	10	
								ESE(OE)	50	20	
10	UCBMM741	MM	Services Science and Service Operational Management (MM-V)	3	0	0	3	ESE	100	40	
			Total	**16**	**0**	**14**	**23**	**Total**	**850**		
	Total Contact Hours =30, Total Credits =23										

	Teaching and Evaluation Scheme for Final Year Semester-VIII										
Sr. No.	**Course Code**	**Course Category**	**Course**	**Teaching Scheme**				**Evaluation Scheme**			
				L	**T**	**P**	**Credits**	**Components**	**Max**	**Min Marks for Pass**	
1	UCBPE08**	PE	Program Elective-IV	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
2	UCBPE08**	PE	Program Elective-V	3	0	0	3	ISE-I	10		40
								ISE-II	10		
								MSE	30		
								ESE	50	20	
3	UCBIL0871	OJT	Project -II	0	0	8	4	ISE	50	20	
								ESE(OE)	50	20	
4	UCBIL0872	OJT	Internship	0	0	12	6	ISE-I	75	30	
								(ISE-II)	75	30	
5	UCBCC0831	CC	Co-Curricular Course-IV	0	0	2	1	ISE	50	20	20
			Total	**06**	**0**	**22**	**17**	**Total 500**			
	Total Contact Hours=28, Total Credits=17										

Program Elective-III		
Sr. No.	**Course Code**	**Course Name**
1	UCBPE0711	Image Processing and Pattern Recognition
2	UCBPE0712	Introduction to IoT
3	UCBPE0713	Deep Learning
Program Elective-IV		
Sr. No.	**Course Code**	**Course Name**
1	UCBPE0811	Quantum Computation & Quantum Information
2	UCBPE0812	Computational Finance & Modelling
3	UCBPE0813	Big-Data
Program Elective-V		
Sr. No.	**Course Code**	**Course Name**
1	UCBPE0814	Behavioural Economics
2	UCBPE0815	Computational Finance & Modelling
3	UCBPE0816	Robotics and Embedded Systems
4	UCBPE0817	Advanced Social, Text and Media Analytics
Open Elective-III		
Sr. No.	**Course Code**	**Course Name**
1	UCBOE0721	Generative AI Tools & Techniques
2	UCBOE0722	Marketing Research and Analytics
3	UCBOE0723	Mobile Computing

Program Elective-III Laboratory		
Sr. No.	**Course Code**	**Course Name**
1	UCBPE0733	Image Processing and Pattern Recognition Laboratory
2	UCBPE0734	Introduction to IoT Laboratory
3	UCBPE0735	Deep Learning Laboratory

Credit Distribution:



MULTI-DISCIPLINARY MINOR IN "FINANCE AND MANAGEMENT"							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBMM0341	Fundamentals of Marketing	2	0	0	2	2
2	UCBMM0441	Financial and Cost Accounting	3	0	0	3	3
3	UCBMM0541	Business Strategies	3	0	0	3	3
4	UCBMM0641	Consumer Behaviour	3	0	0	3	3
5	UCBMM0741	Services Science and Service Operational Management	3	0	0	3	3
					Total:	**14**	**14**

EMERGING AREA OF SPECIALIZATION IN "AR & VR"							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBMN0351	Introduction to AR	3	1	0	4	4
2	UCBMN0451	Introduction to VR	3	1	0	4	4
3	UCBMN0551	Metaverse	3	1	0	4	4
4	UCBMN0651	User Experience Design and Strategies	3	1	0	4	4
5	UCBMN0751	Multimedia and Sensor Input for AR & VR.	2	0	0	2	2
					Total:	**18**	**18**

B.TECH (HONORS) IN COMPUTER SCIENCE AND BUSINESS SYSTEMS WITH SPECIALIZATION IN BLOCKCHAIN TECHNOLOGIES							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBHN0341	Fundamentals of Blockchain	3	1	0	4	4
2	UCBHN0441	Blockchain Platforms and Use cases	3	1	0	4	4
3	UCBHN0541	Blockchain Security and Performance	3	1	0	4	4
4	UCBHN0641	Blockchain and FinTech	3	1	0	4	4
5	UCBHN0741	Mini Project-I	0	0	4	4	2
					Total:	**20**	**18**

EXIT COURSES			
Sr. No.	**Course Code**	**Course Name**	**Credits**
After First Year			
1	UCBEX0291	Certification Course in Graphics Design	3
2	UCBEX0292	Certification Course in Data Analysis	3
3	UCBEX0293	Certification Course in Python for Data Science	2
After Second Year			
1	UCBEX0491	Certification course in Data Science	3
2	UCBEX0492	Certification Course in Web Development	3
3	UCBEX0493	Certification Course in NoSQL	2
After Third Year			
1	UCBEX0691	Certification course in AWS	3
2	UCBEX0692	Certification Course in CISA(Certified Information Systems Auditor	3
3	UCBEX0693	Certification Course in Professional Android Developer	2

ENTREPRENEURSHIP /ECONOMICS/ MANAGEMENT COURSES							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBEM0205	Fundamentals of Economics	2			2	2
2	UCBEM0305	Fundamentals of Management	2			2	2
3	UCBEM0404	Operational Research	3			3	3
		Total:				**7**	**7**

BASIC SCIENCES							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBBS0104	Physics for computing science	2			2	2
2	UCBBS0105	Statistics, Probability and Sampling	3	1		4	4
3	UCBBS0133	Physics for computing science Laboratory			2	2	1
4	UCBBS0203	Linear Algebra	3			3	3
5	UCBBS0204	Statistical Methods	3			3	3
6	UCBBS0233	Statistical Methods Laboratory			2	2	1
7	UCBBS0303	Computational Statistics	3			3	3
8	UCBBS0332	Computational Statistics Laboratory			2	2	1
					Total:	**21**	**18**

ENGINEERING SCIENCE							
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBES0102	Discrete Mathematics	3			3	3
2	UCBES0103	Principles of Electrical Engineering	2			2	2
3	UCBES0132	Principles of Electrical Engineering Laboratory			2	2	1
4	UCBES0202	Principles of Electronics	2			2	2
5	UCBES0232	Principles of Electronics Laboratory			2	2	1
					Total:	**11**	**9**

PROGRAM CORE

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	UCBPC0101	Fundamentals of Computer Science	3			3	3
2	UCBPC0131	Fundamentals of Computer Science-Laboratory			2	2	1
3	UCBPC0201	Data Structures and Algorithms	3			3	3
4	UCBPC0231	Data Structures and Algorithms Laboratory			2	2	1
5	UCBPC0301	Formal Language and Automata Theory	3	1		4	4
6	UCBPC0302	Object Oriented Programming using JAVA	2			2	2
7	UCBPC0304	Software Engineering	3			3	3
8	UCBPC0331	Object Oriented Programming using JAVA Laboratory			2	2	1
9	UCBPC0333	Software Engineering Lab			2	2	1
10	UCBPC0401	Operating Systems	3			3	3
11	UCBPC0402	Database Management System	3			3	3
12	UCBPC0403	Computer Organization & Architecture	3			3	3
13	UCBPC0431	Operating Systems Laboratory			2	2	1
14	UCBPC0432	Database Management System-Laboratory			2	2	1
15	UCBPC0433	Computer Organization & Architecture Laboratory			2	2	1
16	UCBPC0501	Design and Analysis of Algorithms	3			3	3
17	UCBPC0502	Compiler Design (LEX & YACC)	3			3	3

18	UCBPC0531	Design and Analysis of Algorithms Lab			2	2	1
19	UCBPC0532	Compiler Design (LEX & YACC) Lab			2	2	1
20	UCBPC0533	Modern Web Application Laboratory			2	2	1
21	UCBPC0601	Computer Networks	3			3	3
22	UCBPC0602	Machine Learning	3			3	3
23	UCBPC0603	Design Thinking	2			2	2
24	UCBPC0604	Information Security	2			2	2
25	UCBPC0631	Computer Network Laboratory			2	2	1
26	UCBPC0632	Machine Learning Laboratory			2	2	1
27	UCBPC0633	Information Security Laboratory			2	2	1
25	UCBPC0701	Usability Design of Software Applications	3			3	3
26	UCBPC0702	Natural Language Processing	3			3	3
27	UCBPC0703	Software Testing	2			2	2
28	UCBPC0731	Natural Language Processing Laboratory			2	2	1
28	UCBPC0732	Software Testing Laboratory			2	2	1
					Total:	**78**	**63**

Program Electives:

PROGRAM ELECTIVE I							
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBPE0511	Cloud, Microservices & Application	3			3	3
2	UCBPE0512	Artificial Intelligence	3			3	3
3	UCBPE0513	IT Project Management	3			3	3
					Total:	**3**	**3**

PROGRAM ELECTIVE II							
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBPE0611	Software Design with UML	3			3	3
2	UCBPE0612	Android Application Development	3			3	3
3	UCBPE0613	Financial Management	3			3	3
					Total:	**3**	**3**

PROGRAM ELECTIVE III							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBPE0711	Quantum Computation & Quantum Information	2			2	2
2	UCBPE0712	Introduction to IoT	2			2	2
3	UCBPE0713	Deep Learning	2			2	2
4	UCBPE0733	Quantum Computation & Quantum Information-Laboratory			2	2	1
5	UCBPE0734	Introduction to IoT-Laboratory			2	2	1
6	UCBPE0735	Deep Learning Laboratory			2	2	1
					Total:	**5**	**3**

PROGRAM ELECTIVE IV							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBPE0811	Image Processing and Pattern Recognition	3			3	3
2	UCBPE0812	Computational Finance & Modelling	3			3	3
3	UCBPE0813	Big-Data	3			3	3
					Total:	**3**	**3**

PROGRAM ELECTIVE V							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBPE0814	Behavioural Economics	2			2	2
2	UCBPE0815	Computational Finance & Modelling	2			2	2
3	UCBPE0816	Robotics and Embedded Systems	2			2	2
4	UCBPE0817	Advanced Social, Text and Media Analytics	2			2	2
					Total:	**2**	**2**

Open Elective Courses:

OPEN ELECTIVE I							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBOE0521	Introduction to Data Analytics	3			3	3
2	UCBOE0522	Behavioural Economics	3			3	3
3	UCBOE0523	Cyber Security	3			3	3
					Total:	3	3

OPEN ELECTIVE II							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBOE0621	Industry 4.0	3			3	3
2	UCBOE0622	Intellectual Property and Entrepreneurship	3			3	3
3	UCBOE0623	Intellectual Property and Entrepreneurship	3			3	3
					Total:	**3**	**3**

Open Elective III							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBOE0721	Generative AI Tools & Techniques	3			3	3
2	UCBOE0722	Marketing Research and Analytics	3			3	3
3	UCBOE0723	Mobile Computing	3			3	3
					Total:	**3**	**3**

VOCATIONAL AND SKILL ENHANCEMENT COURSE							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBVS0135	Desktop Publishing			2	2	1
2	UCBVS0235	Python Programming			2	2	1
3	UCBVS0535	Certification in Red Hat(Edu skills)			2	2	1
					Total:	**6**	**3**

INDIAN KNOWLEDGE SYSTEM							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBIK0207	Indian Environmental Studies	2			2	2
					Total:	2	2

HSSM							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBHS0106	Business Communication & Value Science – I	1		1	1	1
2	UCBHS0234	Business Communication & Value Science – I-Laboratory			2	2	1
					Total:	**3**	**2**

VALUE EDUCATION COURSE							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBVE0306	Indian Constitution	2			2	2
					Total:	**2**	**1**

RESEARCH METHODOLOGY (PROJECT)							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBIL0771	Project-I			8	8	4
2	UCBIL0871	Project-II			8	8	4
					Total:	**16**	**8**

Community Engineering Project/Field Project (PBL/Seminar/Mini Project)							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBIL0371	Mini Project-I			2	2	1
2	UCBIL0471	Mini Project-II			2	2	1
3	UCBIL0571	Mini Project-III			2	2	1
4	UCBIL0671	Mini Project-IV			2	2	1
					Total:	**8**	**4**

Ability Enhancement							
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs./ Week**	**Credits**
1	UCBAE0206	Business Communication & Value Science – II	1			1	1
2	UCBAE0234	Business Communication & Value Science – II-Laboratory			2	2	1
3	UCBAE0405	Business Communication & Value Science –III	2			2	2
4	UCBAE0434	Business Communication & Value Science –III-Laboratory			2	2	1
5	UCBAE0503	Business Communication & Value Science – IV	2			2	2
6	UCBAE0534	Business Communication & Value Science – IV-Laboratory			2	2	1
					Total:	**11**	**08**

Internship/On Job Training							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBIL0872	Internship			12	12	6
					Total:	**12**	**6**

Co-curricular Courses							
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Hrs. / Week**	**Credits**
1	UCBCC0136	Co Curriculum Course			2	2	1
2	UCBCC0435	Co-Curricular Course			2	2	1
3	UCBCC0634	Co-Curricular Course			2	2	1
4	UCBCC0831	Co-Curricular Course			2	2	1
					Total:	**8**	**4**

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