CMR UNIVERSITY
Private University Estd in Karnataka State by Act No. 45 of 2013

School of Engineering and Technology Bachelor of

Technology

Computer Science and Engineering (Data Science)

Scheme of Teaching and Evaluation (STE) Batch

[2025-29]

I Semester (Physics Cycle)

Course Code	Course	CMRU Category	CMRU Sub-Category	AICTE Category	School / Department	Contact Hours / Week	Credit Distribution L-T-P-C
Program Core							
4MATH1012	Engineering Mathematics with Python Lab - I	Foundation	FC	BSC	BS	5	3-0-1-4
4PHYS1013	Engineering Physics	Foundation	FC	BSC	BS	5	3-0-1-4
4ENEE1012	Fundamentals of Electrical Engineering	Foundation	FC	ESC	ECE	3	3-0-0-3
4CSGC1012	Elements of Computer Engineering	Foundation	FC	ESC	CSE	2	2-0-0-2
4CSPL1113	Programming in C	Foundation	FC	ESC	CSE	6	2-0-2-4
Common Core							
CPSAL1062/71/82	Hindi/Kannada/English	PS	-	HSMC	DCCC	2	2-0-0-2
CPSAL1121	Active Communication	PS	-	HSMC	DCCC	3	3-0-0-3
CPSSD1061	Creating with AI	PS	-	HSMC	DCCC	1	1-0-0-1
CCSCD1011	Community Service Programme - I	CPC	-	SDC	SOET	2	0-0-1-1*
TOTAL						**27**	**23 + 1***

*The Community Service-I (COS-I) of 30 hours has to be carried out in the I Semester. The corresponding 1 credit and the CIE will be reflected in the VIII Semester.

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II Semester (Physics Cycle)

Course Code	Course	CMRU Category	CMRU Sub-Category	AICTE Category	School / Department	Contact Hours/ Week	Credit Distribution L-T-P-C
Program Core							
4MATH1022	Engineering Mathematics with Python Lab - II	Foundation	FC	BSC	BS	5	3-0-1-4
4CHEM1014	Engineering Chemistry	Foundation	FC	BSC	BS	3	1-0-1-2
4ENCE1012	Fundamentals of Electronic Engineering	Foundation	FC	ESC	ECE	4	3-0-1-4
4ENCV1071	Engineering Mechanics	Foundation	FC	ESC	CE	2	2-0-0-2
4CSPL1012	Problem solving using Python	Foundation	FC	ESC	CSE	6	2-0-2-4
Common Core							
CPSAD1013	Design Thinking	PS	-	HSMC	DCCC	2	2-0-0-2
CPSDB1011	Career Preparedness Program - I	PS	-	HSMC	DCCC	2	0-0-1-1
GCSCD1021	Community Service -II (COS - II)	CS	-	SDC	SOET	2	0-0-1-1*
TOTAL						**26**	**19 + 1***

Internship- I of 3 credits to be carried out between II and III Semester break. The corresponding 3 credits will be reflected in the VIII Semester.
*The Community Service-II (COS-II) of 30 hours has to be carried out in the II Semester. The corresponding 1 credit and the CIE will be reflected in the VIII Semester.

I Semester (Chemistry Cycle)

Course Code	Course	CMRU Category	CMRU Sub-Category	AICTE Category	School/ Department	Contact Hours/ Week	Credit Distribution L-T-P-C
Program Core							
4MATH1012	Engineering Mathematics with Python Lab - I	Foundation	FC	BSC	BS	5	3-0-1-4
4CHEM1014	Engineering Chemistry	Foundation	FC	BSC	BS	3	1-0-1-2
4ENCE1012	Fundamentals of Electronic Engineering	Foundation	FC	ESC	ECE	4	3-0-1-4
4ENCV1071	Engineering Mechanics	Foundation	FC	ESC	CE	2	2-0-0-2
4CSPL1012	Problem solving using Python	Foundation	FC	ESC	CSE	6	2-0-2-4
Common Core							
CPSAD1013	Design Thinking	PS	-	HSMC	DCCC	2	2-0-0-2
CPSSD1061	Creating with AI	PS	-	HSMC	DCCC	1	1-0-0-1
CCSCD1011	Community ServiceProgramme– I (COS-I)	CPC	-	SDC	SOET	2	0-0-1-1*
TOTAL						**23**	**19 + 1***

*The Community Service-I (COS-I) of 30 hours has to be carried out in the I Semester. The corresponding 1 credit and the CIE will be reflected in the VIII Semester.

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II Semester (Chemistry Cycle)

Course Code	Course	CMRU Category	CMRU Sub-Category	AICTE Category	School/Department	Contact Hours/Week	Credit Distribution L-T-P-C
Program Core							
4MATH1022	Engineering Mathematics with Python Lab - II	Foundation	FC	BSC	BS	5	3-0-1-4
4PHYS1013	Engineering Physics	Foundation	FC	BSC	BS	5	3-0-1-4
4ENEE1012	Fundamentals of Electrical Engineering	Foundation	FC	ESC	ECE	3	3-0-0-3
4CSGC1012	Elements of Computer Engineering	Foundation	FC	ESC	CSE	2	2-0-0-2
4CSPL1113	Programming in C	Foundation	FC	ESC	CSE	6	2-0-2-4
Common Core							
CPSAL1062/71/82	Hindi/Kannada/English	PS	-	HSMC	DCCC	2	2-0-0-2
CPSAL1121	Active Communication	PS	-	HSMC	DCCC	3	3-0-0-3
CPSDB1011	Career Preparedness Program - I	PS	-	HSMC	DCCC	2	0-0-1-1
GCSCD1021	Community Service -II (COS - II)	CS	-	SDC	SOET	2	0-0-1-1*
TOTAL						**27**	**23 + 1***

Internship- I of 3 credits to be carried out between II and III Semester break. The corresponding 3 credits will be reflected in the VIII Semester.

***The Community Service-II (COS-II) of 30 hours has to be carried out in the II Semester. The corresponding 1 credit and the CIE will be reflected in the VIII Semester.**

III Semester

Course Code	Course	CMRU Category	CMRU Sub - Category	AICTE Category	School/ Department	Contact Hours/ Week	Credit Distribution L-T-P-C
Program Core							
4MATH2042	Probability, Statistics and Numerical Methods	Foundation	FC	PCC	BS	5	3-1-0-4
4CSPL2022	Object Oriented Programming using Java	Foundation	IC	PCC	CSE	4	2-0-1-3
4CSPL1022	Data Structures	Foundation	FC	PCC	CSE	5	3-0-1-4
4CSGC2092	Computer Organization and Architecture	Foundation	IC	PCC	CSE	3	3-0-0-3
4CSGC2082	Software Engineering	Foundation	IC	PCC	CSE	3	3-0-0-3
4INTS3010	Internship- I╪	Foundation	-	PCC	CSE	6	0-0-3-3╪
Common Core							
CKSAM1051	Indian Constitution	KSC	-	MC	DCCC	2	2-0-0-2
GCSCD1031	Community Service - III (COS - III)*	CS		SDC	SOET	2	0-0-1-1*
CPSBD1011	Career Preparedness Program - II	PS	-	HSMC	DCCC	2	0-0-1-1
TOTAL						**30**	**20 + 1*+ 3╪**

Internship - I credits are reflected in the VIII Semester.
*The Community Service-III (COS-III) of 30 hours has to be carried out in the III Semester. The corresponding 1 credit and the CIE will be reflected in the VIII Semester

IV Semester

Course Code	Course	CMRU Category	CMRU Sub-category	AICTE Category	School/ Dept	Contact Hours/ Week	Credit Dist.: L-T-P-C
Program Core							
4MATH2051	Discrete Mathematics and Combinatorics	Foundation	FC	BSC	BS	4	3-1-0-4
4CSGC2022	Database Management Systems	Foundation	IC	PCC	CSE	4	2-0-1-3
4CSGC2043	Operating Systems	Foundation	IC	PCC	CSE	3	3-0-0-3
4CSDS2022	Data Visualization	Foundation	IC	PCC	CSE	3	3-0-0-3
4CSGC2053	Design and Analysis of Algorithms	Foundation	IC	PCC	CSE	4	2-0-1-3
CPSES1013	Making with Electronics	PS	-	ESC	ECE	5	1-0-2-3
Common Core							
GCSCD1041	Community Service - IV (COS - IV)*	CS	-	SDC	SOET	2	0-0-1-1*
CKSAA1033	Introduction to Philosophical Thoughts	KSC		MC	DCCC	1	1-0-0-1
CPSDR1011	Career Preparedness Program - III	PS	-	HSMC	DCCC	2	0-0-1-1
TOTAL						**24**	**21 + 1***

Internship- II of 3 credits to be carried out between IV and V Semester break. The corresponding 3 credits will be reflected in the VIII Semester.
*The Community Service-IV (COS-IV) of 30 hours has to be carried out in the IV Semester. The corresponding 1 credit and the CIE will be reflected in the VIII Semester.

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V Semester

Course Code	Course	CMRU Category	CMRU Subcategory	AICTE Category	School/ Department	Contact Hours/ Week	Credit Distribution L-T-P-C
Program Core							
4CSPL2012	Web Development using Python and Django	Foundation	IC	PCC	CSE	4	2-0-1-3
4CSDS2052	Introduction to Big Data Analytics	Foundation	FC	PCC	CSE	3	3-0-0-3
4CSPL3012	Python for Data Science	Foundation	IC	PCC	CSE	4	2-0-1-3
4CSGC1XX1	Open Elective 1	Elective	IC	OEC	N/A	3	3-0-0-3
4CSGC2XX1	Professional Elective 1	Elective	IC	PEC	CSE	3	3-0-0-3
		Interdisciplinary Elective1	IDE	OEC		3	3-0-0-3
4INTS3020	Internship-II†	Foundation	Internship	PCC	CSE	6	0-0-3-3†
Common Core							
CKSHA1011	Indian Traditions: Values and Critical Inquiry	KSC	-	HSMC	DCCC	2	2-0-0-2
CCSAE1011	Disaster Management	KSC	-	HSMC	DCCC	2	2-0-0-2
TOTAL						**30**	**22 + 3†**

Internship - II credits are reflected in the VIII Semester

PROFESSIONAL ELECTIVE–1: ARTIFICIAL INTELLIGENCE	
4CSPL3021	Advanced Python for AI (MOOC)
4CSGC3011	Artificial Intelligence
4CSPL3031	R Language(MOOC)

PROFESSIONAL ELECTIVE–1: CYBER SECURITY	
4CSGC3041	Cryptography (MOOC)
4CSGC3051	Software Security(MOOC)
4CSGC3061	Secure Coding

PROFESSIONAL ELECTIVE–1: APPLICATION DEVELOPMENT	
4CSPL3041	Advanced Java
4CSPL3051	Scripting Languages (MOOC)
4CSPL3061	Kotlin (OO+Functional)(MOOC)

PROFESSIONAL ELECTIVE–1: NETWORKING	
4CSPL3071	Network programming in Unix & C (MOOC)
4CSPL3081	Python for Networking (MOOC)
4CSGC3071	Client-Server Technologies

OPEN ELECTIVE–1	
4ENME2131	Fundamentals of Robotics and Applications
4ENCV2101	Remote Sensing & Applications
4ENCC1021	Introduction to Digital Image Processing

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VI Semester

Course Code	Course	CMRU Category	CMRU Subcategory	AICTE Category	School/ Department	Contact Hours / Week	Credit Distribution L-T-P-C
Program Core							
4CSGC2061	Data Communication & Computer Networks	Foundation	IC	PCC	CSE	4	2-0-1-3
4CSGC3081	Data Mining	Foundation	AC	PCC	CSE	3	3-0-0-3
4CSPL3091	No-SQL Databases	Foundation	IC	PCC	CSE	4	2-0-1-3
4CSGC1XX2	Open Elective 2	Elective	IC	OEC	N/A	3	3-0-0-3
4CSGC2XX1	Professional Elective 2	Elective	IC	PEC	CSE	3	3-0-0-3
		Inter disciplinary Elective 2	IDE	OEC		3	3-0-0-3
Common Core							
CKSAM1021	Environment and Sustainability	CS	-	HSMC	DCCC	2	2-0-0-2
CSSAE10XX	Contributing to Society (Elective)	CS	-	HSMC	DCCC	2	2-0-0-2
TOTAL						**24**	**22**
	Training and Placement	PS			AECC	DCCC	GR

Internship- III of 3 credits to be carried out between VI and VII Semester break. The corresponding 3 credits will be reflected in the VIII Semester.

PROFESSIONAL ELECTIVE–2: ADVANCED COMPUTING	
4CSGC3121	Soft Computing (Fuzzy, Genetic, Ontologies) (MOOC)
4CSGC2072	Cloud Computing (MOOC)
4CSPL3101	Applied Machine Learning (MOOC)

PROFESSIONAL ELECTIVE–2: CYBER SECURITY	
4CSGC3131	System Security
4CSGC3141	Ethical Hacking (MOOC)
4CSGC3151	Malware analysis (MOOC)

PROFESSIONAL ELECTIVE–2: APPLICATION DEVELOPMENT	
4CSPL3111	Object Oriented Analysis Design
4CSPL3121	Web Technology Frameworks (MOOC)
4CSPL3131	Application Development using MERN Stack (MOOC)

PROFESSIONAL ELECTIVE–1: NETWORKING	
4CSPL3141	Advanced Computer Networks
4CSGC3161	Wireless Technologies (MOOC)
4CSGC3171	Multimedia Networking (MOOC)

OPEN ELECTIVE–2	
4ENME2141	Advanced Robotics: Integration of Control, Programming, and AI
4ENCV2111	Geographic Information System & Applications
4ENCC1021	Advance Digital Image Processing

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VII Semester

Course Code	Course	CMRU Category	CMRU Subcategory	AICTE Category	School/ Department	Contact Hours / Week	Credit Distribution L-T-P-C
Program Core							
4CSPL2041	Machine Learning	Foundation	AC	PCC	CSE	5	3-0-1-4
4CSGC3XX1	Professional Elective 3	Elective	AC	PEC	CSE	3	3-0-0-3
4CSGC3XX1	Professional Elective 4	Elective	AC	PEC	CSE	3	3-0-0-3
CPSHS1021	Business Management for Engineers	PS	-	HSMC	SOM	1	1-0-0-1
		Inter disciplinary Elective 3	IDE	OEC		3	3-0-0-3
4CAPS4010	Capstone Project Phase I†	Foundation	Capstone Project Phase I	PROJ	CSE	6	0-0-8-8†
4INTS4010	Internship-III†	Foundation	Internship	PCC	CSE	6	0-0-3-3†
Common Core							
	Training and Placement	PS	-	AECC	DCCC	2	GR
TOTAL						**29**	**14** + 3† + 8†

Capstone project phase I & Internship - III credits are reflected in the VIII Semester.

PROFESSIONAL ELECTIVE–3,4: ARTIFICIAL INTELLIGENCE

4CSPL4021	Deep Learning (MOOC)
4CSPL4031	Big Data and Analytics (MOOC)
4CSPL4041	Robotic Process Automation (MOOC)
4CSPL4051	Natural Language Processing

PROFESSIONAL ELECTIVE–3,4: CYBER SECURITY

4CSPL4061	Mobile Computing Security (MOOC)
4CSPL4071	Digital Forensics (MOOC)
4CSPL4081	Cloud Computing Security (MOOC)
4CSPL4091	Web Security

PROFESSIONAL ELECTIVE–3,4: APPLICATION DEVELOPMENT

4CSPL4101	J2EE Technologies (MOOC)
4CSPL4111	.NET Technologies (MOOC)
4CSPL4121	JavaScript
4CSPL4131	Microservices (MOOC)

PROFESSIONAL ELECTIVE–3,4: NETWORKING

4CSPL4141	Software Defined Networks
4CSPL4151	Storage Area Networks (MOOC)
4CSPL4161	Virtualization & Cloud Computing (MOOC)
4CSPL4171	Network Administration (MOOC)

VIII Semester

Course Code	Course	CMRU Category	CMRU Subcategory	AICTE Category	School/ Department	Contact Hours / Week	Credit Distribution L-T-P-C
Program Core							
4CAPS4010	Capstone Project Phase II	Foundation	Capstone	PCC	CSE	16	0-0-8-8
4INTS3010	Internship- I	Foundation	Internship	PCC	CSE	-	0-0-3-3
4INTS3020	Internship- II	Foundation	Internship	PCC	CSE	-	0-0-3-3
4INTS4010	Internship- III	Foundation	Internship	PCC	CSE	-	0-0-3-3
GCSCD1011	Community Service -I (COS - I)*	CS	-	SDC	SOET	-	0-0-1-1
GCSCD1021	Community Service -II (COS - II)*	CS	-	SDC	SOET	-	0-0-1-1
GCSCD1031	Community Service -III (COS - III)*	CS	-	SDC	SOET	-	0-0-1-1
GCSCD1041	Community Service -IV (COS - IV)*	CS	-	SDC	SOET	-	0-0-1-1
TOTAL						**16**	**21**

The credits of Internship - I taken up after the II Semester is reflected in the VIII Semester

The credits of Internship - II taken up after the IV Semester is reflected in the VIII Semester

The credits of Internship - III taken up after the VI Semester is reflected in the VIII Semester

* The credit of Community Service - I (COS-I) / Community Service - II (COS-II) / Community Service - III (COS-III) / Community Service - IV(COS-IV) of 30 hours each that was carried out in the I / II / III and IV Semesters respectively is reflected in the VIII Semester.

INTERDISCIPLINARY ELECTIVE (IDE) COURSES:

Course Code	School	Course Name	Semester
6IDSS1011	SOM	Introduction to Financial Management	Odd
6IDSS1031	SOM	Basics of Entrepreneurship	Odd
6IDSS1051	SOM	Finance for Non-Finance Students	Odd
6IDSS1071	SOM	Marketing - For the Uninitiated	Odd
3IDSS1011	SOEC	Accounting for Beginners	Odd
3IDSS1031	SOEC	Introduction to Taxation	Odd
3IDSS1051	SOEC	Personal Income Tax	Odd
3IDSS1071	SOEC	Financial Markets and Personal Investment	Odd
8IDSS1011	SOSS	Web designing	Odd
8IDSS1031	SOSS	Python Programming Basics	Odd
8IDSS1051	SOSS	Introduction to Media	Odd
8IDSS1061	SOSS	Media Technology	Odd
5IDSS1011	SOLS	Essentials of Human Rights and Public Interest Law	Odd
7IDSS1021	SOSSH	Personality & Development	Odd
7IDSS1031	SOSSH	Media & Cultural Studies	Odd
7IDSS1051	SOSSH	Mental Health at workplace	Odd
7IDSS1071	SOSSH	Positive Psychology	Odd
2IDSS1011	SOA	Exploration in Printmaking and Digital Fabrication	Odd
NIDSS1021		NCC I -2	Odd
NIDSS1041		NCC I -4	Odd
6IDSS1021	SOM	Human Resource Management - How it Really Works	Even
6IDSS1041	SOM	Introduction to Digital Marketing	Even
6IDSS1061	SOM	Entrepreneurship - A Primer	Even
3IDSS1021	SOEC	Fundamentals of Banking	Even
3IDSS1041	SOEC	Stock Market Operations	Even

3IDSS1061	SOEC	Financial Management	Even
8IDSS1021	SOSS	Structured Query Language (SQL)	Even
8IDSS1041	SOSS	Mobile App development	Even
8IDSS1071	SOSS	Media Psychology	Even
8IDSS1081	SOSS	Web Technology	Even
5IDSS1021	SOLS	Essential Laws for Business Enterprise	Even
7IDSS1011	SOSSH	Environmental Psychology	Even
7IDSS1041	SOSSH	Women Studies	Even
7IDSS1061	SOSSH	Community Psychology	Even
7IDSS1081	SOSSH	Youth Development	Even
NIDSS1011		NCC I - 1	Even
NIDSS1031		NCC I - 3	Even

COMMON CORE - ARTS AND PHILOSOPHY COURSES:

Course Code	Course Name
CKSMA1011	History, Theory and Ideas of Western Philosophy
CKSMA1021	Ideas and Practices of India's Folk Arts and Crafts
CKSMA1031	Introduction to Philosophical Thoughts
CKSMA1041	India's Classical Performing Arts

COMMON CORE - SKILL ENHANCEMENT COURSES (SEC):

Course Code	Course Name	Semester
CPSSF1011	Foreign Language-French L1	Odd
CPSSF2011	Foreign Language-French L2	Even
CPSSF3011	Foreign Language-French L3	Odd
CPSSF1021	Foreign Language-German L1	Odd
CPSSF2021	Foreign Language-German L2	Even
CPSSF3021	Foreign Language-German L3	Odd
CPSSF1031	Foreign Language-Korean L1	Odd
CPSSF2031	Foreign Language-Korean L2	Even
CPSSF3031	Foreign Language-Korean L3	Odd
CPSSF1041	Foreign Language-Spanish L1	Odd
CPSSF2041	Foreign Language-Spanish L2	Even
CPSSF3041	Foreign Language-Spanish L3	Odd
CPSSN1011	NCC S -1	Odd
CPSSN1021	NCC S -2	Even
CPSSN1031	NCC S -3	Odd
CPSSN1041	NCC S -4	Odd
CPSSD1011	Problem Solving through Programming	Odd/Even
CPSSD1021	Project Management Fundamentals	Odd/Even
CPSSD1031	Qualitative Research	Odd/Even
CPSSD1041	Quantitative Research	Odd/Even

COMMON CORE (NON-CREDIT): GRADUATE REQUIREMENT

Career Preparedness: Discover-Build-Deliver (DBD) Modules

Career Preparedness Courses	Semester	Career Preparedness Courses	Semester
Discover - Know myself (AI/assessment tests)	I	Build (common) - Understand your digital footprints	IV
Discover - Explore career options in the current landscape	II	Build (common) - Preparing for internship (b)	IV
Discover - Explore 21st century skills	II	Build (work track) - Prepare for case studies	IV
Discover - Understand the industry/sector	II	Build (common) - Finding the right internship	V
Discover - Map career goals	II	Build (higher-ed track)	V
Discover - Growth mindset	II	Build (work track) - Prepare for interviews and GDs	VI
Discover - Develop habits for lifelong learning	II	Build (entrepreneurship track)	VI
Discover - Reflective Paper	II	Build (research track)	VI
Build (common) - Create a resume	III	Build (work track) - Prepare for career fair	VII
Build (common) - Preparing for internship (a)	III	Deliver - Build your resume and cover letter	VII
Build (common) - Develop social and emotional intelligence	III	Deliver - Establish your personal brand	VII
Build (common) - Choose the right mentors	III	Deliver - Develop financial literacy	VII
Build (common) - prepare for aptitude tests (only training)	III-IV	Deliver - Manage your personal and professional growth	VII
Build (common) - prepare for Coding tests (only training)	III-IV	Deliver - Placement / Final Internship	VIII

Community Service

Mandatory Community Service	Semester
Social Impact Leadership Summit	I Semester
Community Service Activities	I to VI Semester
Reflective Conclave	VI Semester
Total hours of Community Service : 150 hours (25 hours per Semester) Deficit of Community Service Hours in a particular semester has to be completed in the subsequent semester on obtaining prior permission from the Dean/Director of the School	

First/Second Semester Syllabus