COURSE STRUCTURE

for

B.TECH. DEGREE

in

INFORMATION TECHNOLOGY

(Applicable from the academic session 2024-2025)

Dr. B. C. Roy Engineering College

An Autonomous Institution

Approved by: All India Council for Technical Education (AICTE)

Affiliated to: Maulana Abul Kalam Azad University of Technology, West Bengal (Formerly Known as -WBUT)

Jemua Road, Durgapur, West Bengal, India,713206

The first-year course structure (cf. Page 3 and Page 4) is unanimously accepted and approved in the first BoS meeting held in the Department of a) Physics, b) Chemistry, c) Mathematics, d) English, e) Electrical Engineering, f) Electronics and Communication Engineering, g) Computer Science and Engineering, h) Mechanical Engineering

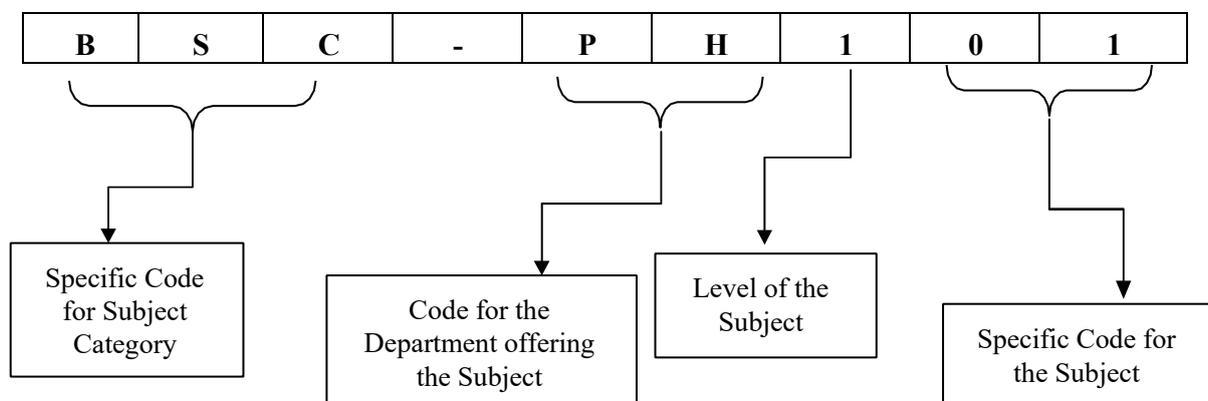The BoS of the Department of Information Technology in its first meeting (held on 30th October 2024 in online mode (using Google meet) at 11:00 am (IST) onwards) has unanimously accepted and approved the four year course structure of the Department of Information Technology.

Suman Bhattacharjee
_____
Signature of the BoS Chairman

H.O.D.
Department of Information   Technology
Dr. B. C. Roy Engineering College
DURGAPUR

Subject Numbering Scheme:

B	S	C	-	P	H	1	0	1

- Specific Code for Subject Category
- Code for the Department offering the Subject
- Level of the Subject
- Specific Code for the Subject

Semester Wise Break Up of Credit (New Autonomous Structure)

Sem1	Sem2	Sem3	Sem4	Sem5	Sem6	Sem7	Sem8	Total
20	22	22	22	21	22	22	14	165

S. No.	Category	Breakup of Credits (Actual) As per Proposed Autonomous Structure
1.	Humanities and Social Sciences including Management courses	14
2.	Basic Science Courses	20
3.	Engineering Science courses including workshop, drawing, basics of electrical/ mechanical/ computer etc.	32
4.	Professional core course	73
5.	Professional Elective specialization/branch courses relevant to chosen	6
6.	Multidisciplinary Open Electives Courses	6
7.	Project work, seminar and internship in industry or appropriate workplace/ academic and research institutions in India/abroad	14
8.	Mandatory Non-Credit Courses – Audit Course	0 (2 Non-credit courses)
Total Credits		**165**

B. Tech., 1st Yr (1st Semester)

Sl. No.	Paper Name	Paper Code	Marks	L	T	P	Credit
		Theory					
1	Mathematics-I	BSC-M 101	100	3	0	0	3
2	Chemistry	BSC- CH 101	100	3	0	0	3
3	Basic Electronics Engineering	ESC- EC 101	100	3	0	0	3
4	Engineering Mechanics	ESC-ME 101	100	3	0	0	3
5	Introduction to Computer Hardware and Software	ESC-CS 101	100	3	0	0	3
	Total Theory		500	15	0	0	15
		Practical					
1	Chemistry Lab	BSC-CH 191	100	0	0	2	1
2	Basic Electronics Engineering Lab	ESC-EC 191	100	0	0	2	1
3	Introduction to Computer Hardware and Software Lab	ESC-CS 191	100	0	0	2	1
4	Engineering Graphics	ESC-ME 191	100	0	0	4	2
	Total Practical		400	0	0	10	5
	Total in 1st Semester		900	15	0	10	20
	Mandatory Courses						
1	Environmental Science	MC-ES 101		1	0	0	0

B. Tech. 1st Yr (2nd Semester)

Theory							
Sl. No.	Paper Name	Paper Code	Marks	L	T	P	Credit
1	Mathematics-II	BSC-M 201	100	3	0	0	3
2	Physics	BSC-PH 201	100	3	0	0	3
3	Basic Electrical Engineering	ESC-EE 201	100	3	0	0	3
4	English Language and Technical Communication	HS-MC 201	100	3	0	0	3
5	Programming for problem solving	ESC-CS 202	100	3	0	0	3
	Total Theory		500	15	0	0	15
Practical							
1	Physics Lab	BSC-PH 291	100	0	0	2	1
2	Basic Electrical Engineering Lab	ESC-EE 291	100	0	0	2	1
3	Workshop Practices	ESC-ME 292	100	0	0	4	2
4	Language Lab	HS-MC 291	100	0	0	2	1
5	Programming for Problem Solving Lab	ESC-CS 292	100	0	0	4	2
	Total Practical		500	0	0	14	7
	Total of 2nd Semester		1000	15	0	14	22
Extra-Curricular Activity							
1	NSS	EC-NSS 201	100				0

Total Credit in 1st Year: 42

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Sl. No.	Broad Category	Category	Course Code	Course Title	L	T	P	Total	Credits
				2ⁿᵈ Year 3ʳᵈ Semester					
				Hours per Week					**Credits**
					L	T	P	Total	

2ⁿᵈ Year 3ʳᵈ Semester

Sl. No.	Broad Category	Category	Course Code	Course Title	L	T	P	Total	Credits
➤ **THEORY**									
1	PCC	MAJOR	PCC-IT-301	Data structure and algorithm	3	0	0	3	3
2	BSC	MINOR	BSC-M-301	Mathematics III	3	1	0	4	3
3	ESC	MINOR	ESC-301	Analog and Digital Electronics	3	0	0	3	3
4	PCC	MAJOR	PCC-IT-302	Problem Solving Using Python	3	0	0	3	3
5	BSC	MINOR	BSC-302	Biology for Engineers	3	0	0	3	3
➤ **PRACTICAL/SESSIONAL**									
1	PCC	MAJOR	PCC-IT-391	Data structure and algorithm Laboratory	0	0	4	4	2
2	ESC	MINOR	ESC-391	Analog and Digital Electronics Laboratory	0	0	4	4	2
3	PCC	MAJOR	PCC-IT-392	Problem Solving Using Python Laboratory	0	0	4	4	2
4	HSMC	MINOR	HSMC-391	Soft skill Laboratory-I	0	0	2	2	1
TOTAL THEORY AND PRACTICALS								**30**	**22**

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2ⁿᵈ Year 4ᵗʰ Semester

Sl. No.	Broad Category	Category	Course Code	Course Title	L	T	P	Total	Credits
➤ **THEORY**									
1	PCC	MAJOR	PCC-IT-401	Computer organization and architecture	3	0	0	3	3
2	PCC	MAJOR	PCC-IT-402	Discrete Mathematics	3	0	0	3	3
3	PCC	MAJOR	PCC-IT-403	Design and Analysis of Algorithms	3	0	0	3	3
4	PCC	MAJOR	PCC-IT-404	Formal Language & Automata Theory	3	0	0	3	3
5	PCC	MAJOR	PCC-IT-405	Object Oriented Programming	3	0	0	3	3
➤ **PRACTICAL/SESSIONAL**									
1	PCC	MAJOR	PCC-IT-491	Computer organization and architecture Laboratory	0	0	4	4	2
2	PCC	MAJOR	PCC-IT-493	Design and Analysis of Algorithms Laboratory	0	0	4	4	2
3	PCC	MAJOR	PCC-IT-495	Object Oriented Programming Laboratory	0	0	4	4	2
4	HSMC	MINOR	HSMC-491	Technical Aptitude-I	0	0	2	2	1
TOTAL THEORY AND PRACTICALS								**29**	**22**

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<table>
<tr><td colspan="11" align="center">3rd Year 5th Semester</td></tr>
<tr><td rowspan="2">Sl. No.</td><td rowspan="2">Broad Category</td><td rowspan="2">Category</td><td rowspan="2">Course Code</td><td rowspan="2">Course Title</td><td colspan="4">Hours per Week</td><td rowspan="2">Credits</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Total</td></tr>
<tr><td colspan="10" align="center">➤ THEORY</td></tr>
<tr><td>1</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-501</td><td>Software Engineering and Project management</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>2</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-502</td><td>Operating System</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>3</td><td>PEC</td><td>MAJOR</td><td>PCC-IT-503</td><td>Machine Learning</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>4</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-504</td><td>Data Base Management System</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>5</td><td>MC</td><td>MINOR</td><td>MC-IT-501</td><td>Constitution of India</td><td>0</td><td>0</td><td>0</td><td>2</td><td>0</td></tr>
<tr><td colspan="10" align="center">➤ PRACTICAL/SESSIONAL</td></tr>
<tr><td>1</td><td>PEC</td><td>MAJOR</td><td>PCC-IT-591</td><td>Software Engineering and Project management Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>2</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-592</td><td>Operating System Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>3</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-593</td><td>Machine Learning Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>4</td><td>PEC</td><td>MAJOR</td><td>PCC-IT-594</td><td>Data Base Management System Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>5</td><td>HSMC</td><td>MINOR</td><td>HSMC-591</td><td>Soft skill Laboratory-II</td><td>0</td><td>0</td><td>2</td><td>2</td><td>1</td></tr>
<tr><td colspan="9" align="center">TOTAL THEORY AND PRACTICALS</td><td>32</td><td>21</td></tr>
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<tr><td colspan="11" align="center">3rd Year 6th Semester</td></tr>
<tr><td rowspan="2">Sl. No.</td><td rowspan="2">Broad Category</td><td rowspan="2">Category</td><td rowspan="2">Course Code</td><td rowspan="2">Course Title</td><td colspan="4">Hours per Week</td><td rowspan="2">Credits</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Total</td></tr>
<tr><td colspan="10" align="center">➤ THEORY</td></tr>
<tr><td>1</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-601</td><td>Image Processing</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>2</td><td>OEC</td><td>MINOR</td><td>OEC-IT-601 A/B</td><td>Open elective-I (Human Resource Development and Organizational Behaviour /Numerical methods)</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>3</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-602</td><td>Computer Networks</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>4</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-603</td><td>Data Mining and Data Warehousing</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>5</td><td>PEC</td><td>MAJOR</td><td>PEC-IT-601 A/B/C/D/E</td><td>Professional elective- I (Distributed system/ Web technology/ Soft computing and optimization/Parallel and Distributed Algorithms/ Pattern Recognition)</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td colspan="10" align="center">PRACTICAL/SESSIONAL</td></tr>
<tr><td>1</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-691</td><td>Image Processing Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>2</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-692</td><td>Networking Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>3</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-693</td><td>Data Mining Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>4</td><td>HSMC</td><td>MINOR</td><td>HSMC-691</td><td>Technical aptitude-II</td><td>0</td><td>0</td><td>2</td><td>2</td><td>1</td></tr>
<tr><td colspan="9" align="center">TOTAL THEORY AND PRACTICALS</td><td>29</td><td>22</td></tr>
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<table>
<tr><td colspan="11">4th Year 7th Semester</td></tr>
<tr><td rowspan="2">Sl. No.</td><td rowspan="2">Broad Category</td><td rowspan="2">Category</td><td rowspan="2">Course Code</td><td rowspan="2">Course Title</td><td colspan="4">Hours per Week</td><td rowspan="2">Credits</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Total</td></tr>
<tr><td colspan="10" align="center">➢ THEORY</td></tr>
<tr><td>1</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-701</td><td>Internet of Things</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>2</td><td>OEC</td><td>MINOR</td><td>OEC-IT-701 A/B/C</td><td>Open elective-II (Operation research and optimization / Soft skill & interpersonal communication/ Essence of Indian Knowledge Tradition)</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>3</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-702</td><td>Human Computer Interaction</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>4</td><td>HSMC</td><td>MINOR</td><td>HSMC-701</td><td>Economics for Engineers</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>5</td><td>PROJ</td><td>MAJOR</td><td>PROJ-IT-781</td><td>Mini Project</td><td>6</td><td>0</td><td>0</td><td>6</td><td>6</td></tr>
<tr><td colspan="10" align="center">➢ PRACTICAL/SESSIONAL</td></tr>
<tr><td>1</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-791</td><td>Internet of Things Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td>2</td><td>PCC</td><td>MAJOR</td><td>PCC-IT-792</td><td>Human Computer Interaction Laboratory</td><td>0</td><td>0</td><td>4</td><td>4</td><td>2</td></tr>
<tr><td colspan="9" align="center">TOTAL THEORY AND PRACTICALS</td><td>26</td><td>22</td></tr>
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<tr><td colspan="11">4th Year 8th Semester</td></tr>
<tr><td rowspan="2">Sl. No.</td><td rowspan="2">Broad Category</td><td rowspan="2">Category</td><td rowspan="2">Course Code</td><td rowspan="2">Course Title</td><td colspan="4">Hours per Week</td><td rowspan="2">Credits</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Total</td></tr>
<tr><td colspan="10" align="center">➢ THEORY</td></tr>
<tr><td>1</td><td>PEC</td><td>MAJOR</td><td>PEC-IT-801 A/B/C/D/E</td><td>Professional elective-II (Cyber security/ Artificial Intelligence/ Quantum computing/ Cloud Computing/ Advanced Computer Networks)</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>2</td><td>HSMC</td><td>MINOR</td><td>HSMC-801</td><td>Sustainable development & Environmental science</td><td>3</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>3</td><td>PROJ</td><td>MAJOR</td><td>PROJ-IT-881</td><td>Major Project</td><td>16</td><td>0</td><td>0</td><td>16</td><td>8</td></tr>
<tr><td colspan="9" align="center">TOTAL THEORY AND PRACTICALS</td><td>22</td><td>14</td></tr>
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