



# Programme Specifications

B.Sc.(Hons). Programme

Programme:  
Physics, Chemistry, Mathematics,  
Statistics, Computer Science, Electronics

Department:  
Mathematical & Physical Sciences

Faculty of Mathematical & Physical Sciences  
M.S. Ramaiah University of Applied Sciences

<b>Programme Specifications:</b> B.Sc. (Hons) - P/C/M/S/CS/E	
<b>Faculty</b>	Mathematical and Physical Sciences (FMPS)
<b>Programme</b>	B.Sc. (Hons)- P/C/M/S/CS/E
<b>Dean of Faculty</b>	Dr. Deepak A.S.

**1. Title of the Award**

B.Sc. (Hons) in Physics/Chemistry/Mathematics/Statistics/Computer Science/Electronics

**2. Modes of study**

Full-Time

**3. Awarding Institution / Body**

M.S. Ramaiah University of Applied Sciences – Bengaluru, India

**4. Joint Award**

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**5. Teaching Institution**

Faculty of Mathematical and Physical Sciences

**6. Date of Programme Specifications**

February 2018

**7. Date of Programme Approval by the Academic Council of MSRUAS**

April 2018

**8. Next Review Date**

March 2021

**9. Programme Approving Regulatory Body and Date of Approval**

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**10. Programme Accrediting Body and Date of Accreditation**

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**11. Grade Awarded by the Accreditation Body**

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**12. Programme Accreditation Validity**

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**13. Programme Benchmark**

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#### 14. Rationale for the Programme

B.Sc. Honours in Physics, Chemistry, Mathematics, Statistics, Computer Science and Electronics is an undergraduate honours degree programme designed to create motivated, energetic, thinking and creative graduates to fill the roles as teachers, professors, scientists, professionals and administrators.

Indian economy is experiencing an upward growth right from the beginning of 21<sup>st</sup> century except for a short stint during the mid of present decade necessitating well qualified science graduates to work as teachers, professors, scientists, professionals and often administrators. At present more than 400 million youth are below 18 years of age and government is committed to increase the GER to 30% by 2020, further necessitating more number of teachers and professors to work in schools and colleges. The proposed B.Sc. (Hons) programme designed will act as a foundation and first degree to prepare teachers, professors, scientists, professionals and administrators to meet the challenges of growing economy as well as to meet the growing aspirations of the youth.

The B.Sc. (Hons)- P/C/M/S/CS/E programme at Faculty of Mathematical and Physical Sciences, RUAS has been developed by the members of the faculty based on interactions with various universities, research establishments and industries in India and abroad.

The curriculum is outcome based and it imbibes required theoretical concepts and practical skills in the domain. By undergoing this programme, students develop critical, analytical thinking and problem solving abilities for a smooth transition from academic to real-life work environment. Opportunities are provided for the students to do internship in organizations involved in research & development and also execute a well-defined project in a team to enhance practical skills and problem solving abilities. The students are required to submit a well written project report as partial fulfilment for the award of the degree, which will help develop skills of documenting scientific work.

In addition students are trained in communication skills and interdisciplinary topics to enhance their scope. The various new features like undergoing majors, internship and executing a full-fledged academic project in the programme make the students more versatile generating wide range of opportunities including registering for Masters and Ph.D. programme in a chosen subject area, if one wishes to be considering teaching in a university or working for a research laboratory as a scientist.

The above mentioned features of the programme, advanced teaching and learning resources, and experience of the faculty members with their strong connections with industry and research organizations makes this programme unique.

### 15. Programme Mission

The purpose of the programme is creation of knowledgeable human resources to work in Government, Semi-Government, Private and Public sector organization and also to assume administration positions. With further progression in education, graduates should be able to undertake teaching and research in schools, colleges and universities and scientific organisations.

### 16. Graduate Attributes

1. Ability to apply fundamental knowledge of Physics, Chemistry, Mathematics Statistics, Computer Science and Electronics to solve real life problems in their chosen domain
2. Ability to perform administrative duties in government, semi-government, private and public sector organizations
3. Ability to teach in schools, colleges and universities with relevant training
4. Ability to understand and solve scientific problems by conducting experimental investigations
5. Ability to apply appropriate tools, techniques and understand utilization of resources appropriately in various laboratories
6. Ability to apply basic programming concepts in their chosen domains
7. Ability to understand the effect of scientific solutions on legal, cultural, social and public health and safety aspects
8. Ability to develop sustainable solutions and understand their effect on society and environment
9. Ability to apply ethical principles to scientific practices and professional responsibilities
10. Ability to work as a member of a team, to plan and to integrate knowledge of various disciplines and to lead teams in multidisciplinary settings
11. Ability to make effective oral presentations and communicate technical ideas to a broad audience using written and oral means
12. Ability to adapt to the changes and advancements in science and engage in independent and life-long learning

### 17. Programme Goal

The programme acts as a foundation degree and helps to develop critical, analytical and problem solving skills at first level. The foundation degree makes the graduates employable in scientific organisations and also to assume administrative positions in various types of organisations. With further acquisition of higher level degrees help the graduates to pursue a career in academics or scientific organisations as a researcher.

## 18. Programme Objectives

The Bachelor of Science honours degree programme with Physics, Chemistry, Mathematics, Statistics, Computer Science and Electronics as major subjects enhances the understanding of fundamental laws of nature, behaviour of chemical and physical systems and develops abilities for mathematical and statistical analysis of physical and chemical systems. In addition, the programme imparts abilities to apply the knowledge gained by study of Physics, Chemistry, Mathematics and Statistics for analysing real life situations.

The objectives of the programme are to enable the students to:

1. To impart knowledge on basics of mathematical and physical sciences
2. To facilitate the understanding of behavior of physical systems through the laws and principles of Physics
3. To facilitate the understanding of chemical systems and their reaction chemistry
4. To facilitate the understanding of mathematical and statistical methods for scientific and business analysis
5. To model, simulate and analyze the behavior of physical systems
6. To train students to conduct scientific experiments and document scientific investigations
7. To use commercial software tools for scientific simulations and documentation
8. To educate on professional ethics, economics, social sciences, inter personal and communication skills relevant to professional practice
9. To provide a general perspective on lifelong learning and opportunities for a career in industry, scientific organization, education, business and commerce

## 19. Intended Learning Outcomes of the Programme

The Intended Learning Outcomes (ILOs) are listed under four headings:

1. Knowledge and Understanding, 2. Cognitive Skills 3. Practical Skills and 4. Capability / Transferable Skills.

### 1. Knowledge and Understanding

After undergoing this programme, a student will be able to:

- KU1:** Identify and describe basic laws and principles governing natural and man-made physical systems
- KU2:** Explain the underlying scientific principles that govern the chemical systems
- KU3:** Explain the mathematical methods and their applications
- KU4:** Explain the importance of statistical data collection, modelling, analysis and data representation

### 2. Cognitive Skills

After undergoing this programme, a student will be able to:

- CS1:** Model and simulate simple physical systems based on physical laws, solve and interpret the results
- CS2:** Model reaction kinetics, solve and interpret the results
- CS3:** Solve well formulated mathematical equations and formulate mathematical models for physical systems

**CS4:** Model, analyse and post process stochastic systems

### 3. Practical Skills

After undergoing this programme, a student will be able to:

- PS1:** Perform duties as per the scientific protocols in various laboratories
- PS2:** Use commercially available software tools like MATLAB for solving problems in Physics, Chemistry, Mathematics and Statistics
- PS3:** Write and execute programs using high level languages like R and Python
- PS4:** Perform statistical analyses using various computational tools

### 4. Capability / Transferable Skills

After undergoing this programme, a student will be able to:

- TS1:** Manage information, develop scientific reports and make presentations
- TS2:** Build, Manage and Lead a team to successfully complete a project and Communicate across teams and organizations to achieve professional objectives
- TS3:** Work under various constraints to meet project targets
- TS4:** Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy

**20. Programme Structure****SEMESTER 1 (Common to PCMSE)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC101A	Mechanics	3	2		4	100
2	18MPC102A	Chemistry – I	3	2		4	100
3	18MPC103A	Calculus I	3	2		4	100
4	18MPC104A	Introduction to Statistics and Probability	3	2		4	100
5	18MPL105A	Mechanics Laboratory			2	1	50
6	18MPL106A	Chemistry – I Laboratory			2	1	50
7	18MPL107A	Introduction to Scientific Programming			2	1	50
8	18MPL108A	Introduction to R			2	1	50
9	18HST103A	Communication Skills – I	3			3	100
<b>Total</b>			<b>15</b>	<b>8</b>	<b>8</b>	<b>23</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>31 hours</b>				

**SEMESTER 2 (Common to PCMSE)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC111A	Electricity and Magnetism	3	2		4	100
2	18MPC112A	Inorganic Chemistry	3	2		4	100
3	18MPC113A	Calculus – II	3	2		4	100
4	18MPC114A	Introduction to Probability Distributions	3	2		4	100
5	18MPL115A	Electricity and Magnetism Laboratory			2	1	50
6	18MPL116A	Inorganic Chemistry Laboratory			2	1	50
7	18MPL117A	Data Modelling Laboratory			2	1	50
8	18MPL118A	Introduction to Python			2	1	50
9	18HST104A	Communication Skills – II	3			3	100
<b>Total</b>			<b>15</b>	<b>8</b>	<b>8</b>	<b>23</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>31 hours</b>				

**SEMESTER 3 (Common to PCMS)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC201A	Heat and Thermodynamics	3	2		4	100
2	18MPC202A	Physical Chemistry	3	2		4	100
3	18MPC203A	Calculus and Linear Algebra	3	2		4	100
4	18MPC204A	Inferential Statistics	3	2		4	100
5	18MPL205A	Heat and Thermodynamics Laboratory			2	1	50
6	18MPL206A	Physical Chemistry Laboratory			2	1	50
7	18MPL207A	Calculus and Linear Algebra Laboratory			2	1	50
8	18MPL208A	Data Analysis in R/Python			2	1	50
9	18HST101A	Elements of Social Science and Ethics	2			2	50
10	18CEN201A	Environmental Science	2			2	50
<b>Total</b>			<b>16</b>	<b>8</b>	<b>8</b>	<b>24</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>32 hours</b>				

**SEMESTER 4 (Common to PCMS)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC211A	Waves and Oscillations	3	2		4	100
2	18MPC212A	Organic Chemistry	3	2		4	100
3	18MPC213A	Ordinary Differential Equations	3	2		4	100
4	18MPC214A	Operation Research	3	2		4	100
5	18MPL215A	Waves and Oscillations Laboratory			2	1	50
6	18MPL216A	Organic Chemistry Laboratory			2	1	50
7	18MPL217A	Ordinary Differential Equations Laboratory			2	1	50
8	18MPL218A	Operation Research Laboratory			2	1	50
9	18HST201A	Constitution, Human Rights and Law	2			2	50
<b>Total</b>			<b>14</b>	<b>8</b>	<b>8</b>	<b>22</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>30 hours</b>				



**SEMESTER 5 (Physics Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC301A	Modern Physics	3	2		4	100
2	18MPE311A	Partial Differential Equations	3	2		4	100
3	18MPE312A	Atomic and Molecular Spectroscopy	3	2		4	100
4	18MPE313A	Nuclear Physics	3	2		4	100
5	18OEE31XA	Open Elective -1	3			3	100
6	i. 18MPPS301A ii. 18MPIS302A	i. Seminar ii. Internship (Choose Any One)			6	3	100
7	18MPL301A	Modern Physics Laboratory			2	1	50
8	18MPL311A	Partial Differential Equations Laboratory			2	1	50
9	18MPL312A	Atomic and Molecular Spectroscopy Laboratory			2	1	50
10	18MPL313A	Nuclear Physics Laboratory			2	1	50
<b>Total</b>			<b>15</b>	<b>8</b>	<b>14</b>	<b>26</b>	<b>800</b>
<b>Total number of contact hours per week</b>			<b>37 hours</b>				

**SEMESTER 6 (Physics Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPE314A	Semiconductor Physics and Devices	3	2		4	100
2	18MPE315A	Laser Physics and Applied Optics	3	2		4	100
3	18MPE316A	Nanoscience and Nanotechnology	3	2		4	100
4	18OEE32XA	Open Elective -2	3			3	100
5	18MPL314A	Semiconductor Physics and Devices Laboratory			2	1	50
6	18MPL315A	Laser Physics and Applied Optics Laboratory			2	1	50
7	18MPL316A	Nanoscience Laboratory			2	1	50
8	18MPP318A	Project Work			24	12	100
<b>Total</b>			<b>12</b>	<b>6</b>	<b>30</b>	<b>30</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>48 hours</b>				

**SEMESTER 5 (Chemistry Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC301A	Modern Physics	3	2		4	100
2	18MPE321A	Advanced Chemistry	3	2		4	100
3	18MPE322A	Analytical Chemistry	3	2		4	100
4	18MPE323A	Green Chemistry	3	2		4	100
5	18OEE31XA	Open Elective -1	3			3	100
6	i. 18MPPS301A ii. 18MPIS302A	i. Seminar ii. Internship (Choose Any One)			6	3	100
7	18MPL301A	Modern Physics Laboratory			2	1	50
8	18MPL321A	Advanced Chemistry Laboratory			2	1	50
9	18MPL322A	Analytical Chemistry Laboratory			2	1	50
10	18MPL323A	Green Chemistry Laboratory			2	1	50
<b>Total</b>			<b>15</b>	<b>8</b>	<b>14</b>	<b>26</b>	<b>800</b>
<b>Total number of contact hours per week</b>			<b>37 hours</b>				

**SEMESTER 6 (Chemistry Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPE324A	Industrial Chemistry	3	2		4	100
2	18MPE325A	Polymer Chemistry	3	2		4	100
3	18MPE326A	Medicinal Chemistry	3	2		4	100
4	18OEE32XA	Open Elective -2	3			3	100
5	18MPL324A	Industrial Chemistry Laboratory			2	1	50
6	18MPL325A	Polymer Chemistry Laboratory			2	1	50
7	18MPL326A	Medicinal Chemistry Laboratory			2	1	50
8	18MPP318A	Project Work			24	12	100
<b>Total</b>			<b>12</b>	<b>6</b>	<b>30</b>	<b>30</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>48 hours</b>				

**SEMESTER 5 (Mathematics Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC301A	Modern Physics	3	2		4	100
2	18MPE311A	Partial Differential Equations	3	2		4	100
3	18MPE331A	Mathematical Analysis	3	2		4	100
4	18MPE332A	Discrete Mathematics	3	2		4	100
5	18OEE31XA	Open Elective -1	3			3	100
6	i. 18MPPS301A ii. 18MPIS302A	iii.Seminar iv. Internship (Choose Any One)			6	3	100
7	18MPL301A	Modern Physics Laboratory			2	1	50
8	18MPL311A	Partial Differential Equations Laboratory - I			2	1	50
9	18MPL331A	Fourier Series Laboratory			2	1	50
10	18MPL332A	Discrete Mathematics Laboratory			2	1	50
<b>Total</b>			<b>15</b>	<b>8</b>	<b>14</b>	<b>26</b>	<b>800</b>
<b>Total number of contact hours per week</b>			<b>37 hours</b>				

**SEMESTER 6 (Mathematics Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPE333A	Applied Mathematical Methods	3	2		4	100
2	18MPE334A	Abstract Algebra	3	2		4	100
3	18MPE335A	Number Theory	3	2		4	100
4	18OEE32XA	Open Elective -2	3			3	100
5	18MPL333A	Applied Mathematical Methods Laboratory			2	1	50
6	18MPL334A	Partial Differential Equations Laboratory - II			2	1	50
7	18MPL335A	Number Theory Laboratory			2	1	50
8	18MPP318A	Project Work			24	12	100
<b>Total</b>			<b>12</b>	<b>6</b>	<b>30</b>	<b>30</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>48 hours</b>				

**SEMESTER 5 (Statistics Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC301A	Modern Physics	3	2		4	100
2	18MPE311A	Partial Differential Equations	3	2		4	100
3	18MPE331A	Mathematical Analysis	3	2		4	100
4	18MPE332A	Discrete Mathematics	3	2		4	100
5	18OEE31XA	Open Elective -1	3			3	100
6	i. 18MPPS301A ii. 18MPIS302A	v. Seminar vi. Internship (Choose Any One)			6	3	100
7	18MPL301A	Modern Physics Laboratory			2	1	50
8	18MPL311A	Partial Differential Equations Laboratory			2	1	50
9	18MPL331A	Fourier Series Laboratory			2	1	50
10	18MPL332A	Discrete Mathematics Laboratory			2	1	50
<b>Total</b>			<b>15</b>	<b>8</b>	<b>14</b>	<b>26</b>	<b>800</b>
<b>Total number of contact hours per week</b>			<b>37 hours</b>				

**SEMESTER 6 (Statistics Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPE341A	Stochastic Process	3	2		4	100
2	18MPE342A	Time Series Analysis	3	2		4	100
3	18MPE343A	Design of Experiments	3	2		4	100
4	18OEE32XA	Open Elective -2	3			3	100
5	18MPL341A	Stochastic Process Laboratory			2	1	50
6	18MPL342A	Time Series Analysis Laboratory			2	1	50
7	18MPL343A	Design of Experiments Laboratory			2	1	50
8	18MPP318A	Project Work			24	12	100
<b>Total</b>			<b>12</b>	<b>6</b>	<b>30</b>	<b>30</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>48 hours</b>				

**SEMESTER 1 (Computer Science Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC103A	Calculus I	3	2		4	100
2	18MPC104A	Introduction to Statistics and Probability	3	2		4	100
3	19CSEC102A	Discrete Mathematics	4			4	100
4	19CSEC101A	Elements of Computer Science & Engineering	3	2		4	100
5	19CSEL103A	Programming laboratory			2	1	50
6	18MPL107A	Introduction to Scientific Programming 1			2	1	50
7	18HST103A	Communication Skills-1	3			3	100
<b>Total</b>			<b>16</b>	<b>6</b>	<b>4</b>	<b>21</b>	<b>600</b>
<b>Total number of contact hours per week</b>			<b>26 hours</b>				

**SEMESTER 2 (Computer Science Discipline)**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC113A	Calculus II	3	2		4	100
2	18MPC114A	Introduction to Probability Distributions	3	2		4	100
3	19CSEC111A	Software Development Fundamentals	3			3	100
4	19CSEC112A	Data Structures and Algorithms	4			4	100
5	19CSEC113A	Software Development Fundamentals Laboratory			2	1	50
6	18MPL117A	Data Modelling Laboratory			2	1	50
7	19CSEL113A	Data Structures and Algorithms Laboratory			2	1	50
8	18HST104A	Communication Skills -2	3			3	100
<b>Total</b>			<b>16</b>	<b>4</b>	<b>6</b>	<b>21</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>26</b>				

**SEMESTER 3 (Computer Science Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC203A	Abstract and Linear Algebra	3	2		4	100
2	18MPC204A	Inferential Statistics	3	2		4	100
3	19CSEC201A	Database Systems	3			3	100
4	19CSEC202A	Computer Networks	3			3	100
5	19CSEC203A	Microprocessors and Assembly Language Programming	3			3	100
6	19CSEL204A	Database Laboratory			2	1	50
7	18MPL207A	Calculus and Linear Algebra Laboratory			2	1	50
8	19CSEL205A	Computer Networks Laboratory			2	1	50
9	18HST101A	Elements of Social Science and Ethics			2	1	50
<b>Total</b>			<b>15</b>	<b>4</b>	<b>8</b>	<b>21</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>27 hours</b>				

**SEMESTER 4 (Computer Science Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19CSEC210A	Programming Paradigms	3	2		4	100
2	19CSEC211A	Graph Theory and Optimization	3			3	100
3	19CSEC212A	Artificial Intelligence	3	2		4	100
4	19CSEC213A	Web Architecture and Application Development	3			3	100
5	19CSEC214A	Information Security & Protection	3	2		4	100
6	19CSEC215A	Formal Languages and Automata Theory	3			3	100
7	19CSEL216A	Artificial Intelligence Laboratory			2	1	50
8	19CSEL217A	Web Architecture and Application Development laboratory			2	1	50
9	19CSEL218A	Programming Paradigms Laboratory			2	1	50
10	18HST210A	Constitution, Human Rights and Law	2			2	50
<b>Total</b>			<b>20</b>	<b>6</b>	<b>6</b>	<b>26</b>	<b>800</b>
<b>Total number of contact hours per week</b>			<b>32 hours</b>				

**SEMESTER 5 (Computer Science Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19CSEC301A	Data Science	3	2		4	100
2	19CSEC30XA	Professional Core 1	3	2		4	100
3	19CSEC30XA	Professional Core 2	3	2		4	100
4	19CSE30XA	Open Elective 1	3			3	50
5	18CSEL313A	Data Science Laboratory			2	1	50
6	19CEM210A	Environmental Science	2			2	50
7	18MPP308A	Industrial Tour			8	4	50
<b>Total</b>			<b>14</b>	<b>6</b>	<b>10</b>	<b>22</b>	<b>500</b>
<b>Total number of contact hours per week</b>			<b>34 hours</b>				

**SEMESTER 6 (Computer Science Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19CSEE31XA	Professional Core 3	4			4	100
2	19CSE31AA	Professional Core 4	4			4	100
3	18OEE32XA	Open Elective -2	3			3	100
4	18CSEL313A	Data Science Laboratory			2	1	50
5	i. 18MPPS301A ii. 18MPIS302A	i. Seminar ii. Internship (Choose Any One)			8	4	100
6	18MPP318A	<b>Project Work</b>			32	16	200
<b>Total</b>			<b>11</b>	<b>0</b>	<b>42</b>	<b>32</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>53 hours</b>				

**SEMESTER 3 (Electronics Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18MPC203A	Calculus and Linear Algebra	3	2		4	100
2	18ELNC202A	Basic Electronic Devices	3	2		4	100
3	18ELNC203A	Basic Electrical Science	3	2		4	100
4	18CSEC204A	Basic Computer Science	3	2		4	100
5	18MPC207A	Calculus and Linear Algebra Laboratory			2	1	50
6	18ELNL206A	Basic Electronic Devices Laboratory			2	1	50
7	18ELNL207A	Basic Electrical Science Laboratory			2	1	50
8	18CSEL208A	Basic Computer Science Laboratory			2	1	50
9	18HST101A	Elements of Social Science and Ethics	2			2	50
10	18CEN201A	Environmental Science	2			2	50
<b>Total</b>			<b>16</b>	<b>8</b>	<b>8</b>	<b>24</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>32 hours</b>				

**SEMESTER 4 (Electronics Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18CSEC212A	Data Structures and Programming	3	2		4	100
2	18ELNC211A	Electronic Circuits	3	2		4	100
3	18ELNC212A	Signals and Systems	3	2		4	100
4	18ELNC213A	Digital Electronics	3	2		4	100
5	18ELNC214A	Photonics and Power Electronics	3			3	100
6	18CSEL215A	Data Structures and Programming Laboratory			2	1	50
7	18ELNL216A	Electronic Circuits Laboratory			2	1	50
8	18ELNL217A	Signals and Systems Laboratory			2	1	50
9	18ELNL218A	Digital Electronics Laboratory			2	1	50
10	18HST201A	Constitution, Human Rights and Law	2			2	50
<b>Total</b>			<b>17</b>	<b>8</b>	<b>8</b>	<b>25</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>33 hours</b>				



**SEMESTER 5 (Electronics Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18ELNC301A	Network Analysis	3	2		4	100
2	18ELNC302A	Embedded Processors and Controllers	3	2		4	100
3	18ELNC303A	Integrated Circuits	3	2		4	100
4	18ELNC304A	Electromagnetic Theory and Antennas	3			3	100
5	18OEE31XA	Open elective – 1	3			3	100
6	i. 18MPPS301A ii. 18MPIS302A	i. Seminar ii. Internship (Choose any one)			6	3	100
7	18ELNL305A	Embedded Processors and Controllers Laboratory			2	1	50
8	18ELNL306A	Integrated Circuits Laboratory			2	1	50
<b>Total</b>			<b>15</b>	<b>6</b>	<b>12</b>	<b>23</b>	<b>600</b>
<b>Total number of contact hours per week</b>			<b>33 hours</b>				

**SEMESTER 6 (Electronics Discipline)**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	18ELNC310A	Electronic Instrumentation	3	2		4	100
2	18ELNC311A	Communication Systems	3	2		4	100
3	18ELNC312A	Sensors and Data Acquisition	3	2		4	100
4	18OEE32XA	Open elective – 2	3			3	100
5	18ELNL313A	Electronic Instrumentation Laboratory			2	1	50
6	18ELNL314A	Communication Systems Laboratory			2	1	50
7	18ELNL315A	Sensors and Data Acquisition Laboratory			2	1	50
8	18MPP318A	Project Work			24	12	100
<b>Total</b>			<b>12</b>	<b>6</b>	<b>30</b>	<b>30</b>	<b>650</b>
<b>Total number of contact hours per week</b>			<b>48hours</b>				

### Open Elective Courses:

A number of electives from faculty of Mathematical and Physical Sciences, Engineering, Management and Commerce, Art and Design, Hospitality Management and Catering Technology, Pharmacy, Dental Sciences will be announced one semester prior to the scheduled semester

### 21. Programme Delivery

As per Time Table

### 22. Teaching and Learning Methods

The module delivery comprises of a combination of few or all of the following:

1. Face to face lectures using audio-visuals
2. Workshops-group discussions, debates, presentations
3. Demonstrations
4. Guest lectures
5. Laboratory-work/Field work/Workshop
6. Industry visit
7. Seminars
8. Group Exercises
9. Project Work
10. Project Exhibitions
11. Technical Events

### 23. Assessment and Grading

1. Every course will be assessed for a weight of 100
2. There are two components- Component-1 and Component-2
3. Component-1 carries a weight of 50% and Component -2 carries a weight of 50%
4. Component-1(CE) is subdivided in to a Test and an Assignment, test carries 25% weight and assignment carries 25% weight.
5. Component-2 is a written examination(SEE) carrying 50% weight
6. Laboratory Examination will have two components:  
Component-1(CE):Conduction of Laboratory Exercises and Submission of Report: 50% weight  
Component-2: SEE (Semester End Laboratory Examination): 50% weight
7. A minimum of overall 40% is required for a pass with 40% in Component-2
8. The marks distribution for each course is given in the programme structure- section 20
9. Other flexibilities (exceptions) are as per the Academic Regulations of B.Sc. (Hons)- P/C/M/S/CS/E programme.

### 24. Attendance

80% attendance is compulsory to appear for semester end examinations. Condoning of attendance shortage is as per the Academic Regulations of B.Sc. (Hons)- P/C/M/S/CS/E programme.

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## 25. Award of Class

As per the Academic Regulations for B.Sc. (Hons)- P/C/M/S/CS/E Programme

## 26. Student Support for Learning

Students are given the following support:

1. Course notes
2. Reference books in the library
3. Magazines and Journals
4. Internet facility
5. Computing facility
6. Laboratory facility
7. Workshop facility
8. Staff support
9. Lounges for discussions
10. Any other support that enhances their learning

## 27. Quality Control Measures

Following are the Quality Control Measures:

1. Review of course notes
2. Review of question papers and assignment questions
3. Student Feedback
4. Moderation of assessed work
5. Opportunities for the students to see their assessed work
6. Review by external examiners and external examiners reports
7. Staff Student Consultative Committee meetings
8. Student exit feedback
9. Subject Assessment Board (SAB)
10. Programme Assessment Board (PAB)

## 28. Curriculum Map

Course Code	Intended Learning Outcomes											
	Knowledge and Understanding				Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving)				Practical skills			
	KU1	KU2	KU3	KU4	CS1	CS2	CS3	CS4	PS1	PS2	PS3	PS4
18MPC101A	X				X							
18MPC102A		X				X						
18MPC103A			X				X					
18MPC104A				X				X				
18MPL105A	X				X				X	X		
18MPL106A		X				X			X	X		
18MPL107A			X				X			X		
18MPL108A				X				X			X	X
18MPC111A	X				X							
18MPC112A		X				X						
18MPC113A			X				X					
18MPC114A				X				X				
18MPL115A	X				X				X	X		
18MPL116A		X				X			X	X		
18MPL117A			X				X			X		
18MPL118A				X				X			X	X
18MPC201A	X				X							
18MPC202A		X				X						
18MPC203A			X				X					
18MPC204A				X				X				
18MPL205A	X				X				X	X		
18MPL206A		X				X			X	X		
18MPL207A			X				X			X		
18MPL208A				X				X			X	X
18MPC211A		X				X						
18MPC212A			X				X					
18MPC213A				X				X				
18MPC214A	X				X				X	X		
18MPL215A		X				X			X	X		
18MPL216A			X				X			X		
18MPL217A				X				X			X	X
18MPL218A	X				X							
18MPC301A		X				X						
18MPE311A			X				X					
18MPE312A				X				X				
18MPE313A	X				X				X	X		
18MPE314A		X				X						
18MPE315A			X				X					
18MPL311A	X				X				X	X		
18MPL312A	X				X				X	X		
18MPL313A	X				X				X	X		
18MPL314A	X				X				X	X		
18MPL315A	X				X				X	X		
18MPL316A	X				X				X	X		
18MPE321A		X				X						
18MPE322A		X				X						
18MPE323A		X				X						
18MPE324A		X				X						
18MPE325A		X				X						
18MPE326A		X				X			X	X		
18MPL321A		X				X			X	X		

18MPL322A		X				X			X	X		
18MPL323A		X				X			X	X		
18MPL324A		X				X			X	X		
18MPL325A		X				X			X	X		
18MPL326A		X				X			X	X		
18MPE311A			X				X					
18MPE331A			X				X					
18MPE332A			X				X					
18MPE333A			X				X					
18MPE334A			X				X					
18MPE335A												
18MPL311A	X				X				X	X		
18MPL331A	X				X				X	X		
18MPL332A	X				X				X	X		
18MPL333A	X				X				X	X		
18MPL334A	X				X				X	X		
18MPL335A			X					X				
18MPE341A			X					X				
18MPE342A			X					X				
18MPE343A			X					X				
18MPL341A				X				X			X	X
18MPL342A				X				X			X	X
18MPL343A				X				X			X	X
18OEE31XA	X				X							
18OEE32XA	X				X							
18MPP318A	X	X	X	X	X	X	X	X	X	X	X	X

## 29. Capability / Transferable Skills Map

Course Code	Skills								
	GK	SL	WC	OC	P	B	IM	PM	L
18MPC101A	X	X	X			X	X	X	
18MPC102A	X	X	X			X	X	X	
18MPC103A	X	X	X			X	X	X	
18MPC104A	X	X	X			X	X	X	
18MPL105A	X	X	X	X	X	X	X	X	X
18MPL106A	X	X	X	X	X	X	X	X	X
18MPL107A	X	X	X	X	X	X	X	X	X
18MPL108A	X	X	X	X	X	X	X	X	X
18HST103A	X	X	X	X	X	X	X	X	X
18MPC111A	X	X	X			X	X	X	
18MPC112A	X	X	X			X	X	X	
18MPC113A	X	X	X			X	X	X	
18MPC114A	X	X	X			X	X	X	
18MPL115A	X	X	X	X	X	X	X	X	X
18MPL116A	X	X	X	X	X	X	X	X	X
18MPL117A	X	X	X	X	X	X	X	X	X
18MPL118A	X	X	X	X	X	X	X	X	X
18HST104A	X	X	X	X	X	X	X	X	X
18MPC201A	X	X	X			X	X	X	
18MPC202A	X	X	X			X	X	X	
18MPC203A	X	X	X			X	X	X	
18MPC204A	X	X	X			X	X	X	
18MPL205A	X	X	X	X	X	X	X	X	X
18MPL206A	X	X	X	X	X	X	X	X	X
18MPL207A	X	X	X	X	X	X	X	X	X
18MPL208A	X	X	X	X	X	X	X	X	X
18HST201A	X	X	X	X	X	X	X	X	X
18CEN201A	X	X	X			X	X	X	
18MPC211A	X	X	X			X	X	X	
18MPC212A	X	X	X			X	X	X	
18MPC213A	X	X	X			X	X	X	
18MPC214A	X	X	X			X	X	X	
18MPL215A	X	X	X	X	X	X	X	X	X
18MPL216A	X	X	X	X	X	X	X	X	X
18MPL217A	X	X	X	X	X	X	X	X	X
18MPL218A	X	X	X	X	X	X	X	X	X
18HST211A	X	X	X			X	X	X	
18MPC301A	X	X	X			X	X	X	
18MPE311A	X	X	X			X	X	X	
18MPE312A	X	X	X			X	X	X	
18MPE313A	X	X	X			X	X	X	
18MPE314A	X	X	X			X	X	X	
18MPE315A	X	X	X			X	X	X	
18MPL311A	X	X	X	X	X	X	X	X	X
18MPL312A	X	X	X	X	X	X	X	X	X
18MPL313A	X	X	X	X	X	X	X	X	X
18MPL314A	X	X	X	X	X	X	X	X	X
18MPL315A	X	X	X	X	X	X	X	X	X
18MPL316A	X	X	X			X	X	X	
18MPE321A	X	X	X			X	X	X	
18MPE322A	X	X	X			X	X	X	
18MPE323A	X	X	X			X	X	X	
18MPE324A	X	X	X			X	X	X	
18MPE325A	X	X	X	X	X	X	X	X	X
18MPE326A	X	X	X	X	X	X	X	X	X

18MPL321A	X	X	X	X	X	X	X	X	X
18MPL322A	X	X	X	X	X	X	X	X	X
18MPL323A	X	X	X	X	X	X	X	X	X
18MPL324A	X	X	X			X	X	X	
18MPL325A	X	X	X			X	X	X	
18MPL326A	X	X	X			X	X	X	
18MPE311A	X	X	X			X	X	X	
18MPE331A	X	X	X			X	X	X	
18MPE332A	X	X	X	X	X	X	X	X	X
18MPE333A	X	X	X	X	X	X	X	X	X
18MPE334A	X	X	X	X	X	X	X	X	X
18MPE335A	X	X	X	X	X	X	X	X	X
18MPL311A	X	X	X	X	X	X	X	X	X
18MPL331A	X	X	X			X	X	X	
18MPL332A	X	X	X			X	X	X	
18MPL333A	X	X	X			X	X	X	
18MPL334A	X	X	X			X	X	X	
18MPL335A	X	X	X	X	X	X	X	X	X
18MPE341A	X	X	X	X	X	X	X	X	X
18MPE342A	X	X	X	X	X	X	X	X	X
18MPE343A	X	X	X	X	X	X	X	X	X
18MPL341A	X	X	X	X	X	X	X	X	X
18MPL342A	X	X	X			X	X	X	
18MPL343A	X	X	X			X	X	X	
18OEE31XA		X	X				X		
18OEE32XA		X	X				X		
18MPPS301A		X	X	X	X	X	X	X	
18MPIS302A		X	X	X	X	X	X	X	
18MPP318A		X	X	X	X	X	X	X	

*GK: Group Work; SL: Self Learning; WC: Written Communication; OC: Oral Communication P: Presentation; B: Behavioural; IM: Information Management; PM: Personal Management L: Leadership*

### 30. Co-curricular Activities

Students are encouraged to take part in co-curricular activities like seminars, conferences, symposium, paper writing, attending industry exhibitions, project competitions and related activities to enhance their knowledge and network.

### 31. Cultural and Literary Activities

To remind and ignite the creative endeavours annual cultural festivals held and the students are made to plan and organize the activities.

### 32. Sports and Athletics

Students are encouraged to develop a habit of taking part in outdoor and indoor games on regular basis.

