

Sapthagiri NPS University, BENGALURU-560057.

B.E. in Electrical and Electronics Engineering; Scheme of Teaching and Examinations 2024 batch
Outcome Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2024-25)

| SN | Course Type | CT | I | II | III | IV | V | VI | VII | VIII | Total Credits | No of courses |
|----|--|----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|---------------|---------------|
| 1 | Basic Sciences | BS | 4 | 7 | 3 | 3 | - | - | - | - | 17 | 5 |
| 2 | Engineering Science Course | ES | 15 | 13 | - | - | - | - | - | - | 28 | 8 |
| 3 | Professional Core Course | PC | - | - | 20 | 16 | 14 | 13 | - | - | 63 | 19 |
| 4 | Professional Elective Course | PE | - | - | - | 3 | 6 | 6 | - | - | 15 | 5 |
| 5 | Open Elective | OE | - | - | - | - | - | - | 6 | - | 6 | 2 |
| 6 | Project Work/Mini Project | PW | - | - | - | - | - | 2 | 3 | 9 | 14 | 3 |
| 7 | Internship / Technical Seminar | IS | - | - | - | - | - | - | 3 | - | 3 | 2 |
| 8 | Humanities, Social Science & Management Course | HS | 3 | - | - | - | 3 | 3 | - | - | 9 | 5 |
| 9 | Ability Enhancement Course - Skill Development | AE | - | 2 | 1 | 1 | - | - | - | - | 4 | 4 |
| 10 | UHV Course | UV | - | - | 1 | 1 | 1 | - | - | - | 3 | 3 |
| 11 | Mandatory Course - non credit | NC | - | - | - | - | y | y | - | - | 0 | 2 |
| | Total | | 22 | 22 | 25 | 24 | 24 | 24 | 12 | 9 | 162 | 58 |

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I Semester E Cycle

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | Credits | |
|--------------|-------------|-----------------------------|--|---|----------------------|----------|--------------------|-------------------|------------|------------|-----------|-------------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | | Total Marks |
| | | | | | L | T | P | | | | | |
| 1. | HS | 24BEELY101A/ 25BEELY101B | Kannada Samskruthi/ Kali Kannada | TD: KANNADA PSB: KANNADA | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| 2. | BS | 24BEELY102 | Linear Algebra and Calculus | TD: MATHS PSB: MATHS | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 3. | HS | 24BEELY103 | Environmental Science and Engineering | TD: CIVIL PSB: CIVIL | 1 | 0 | 0 | 03 | 50 | 50 | 100 | 1 |
| 4. | ES | 24BEELY104 | Basics of Electrical and Electronics Engineering | TD: ECE PSB: ECE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 5. | ES | 24BEELY105 | Problem Solving Using C | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 6. | ES | 24BEELY106 | Fundamentals of Data Structure | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 7. | ES | 24BEELY107 | Fundamentals of Data Science | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 8. | HS | 24BEELY108 | Indian Constitution | TD: CSE-AIML PSB: CSE-AIML | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| Total | | | | | | | | 400 | 400 | 800 | 22 | |

HS: Humanities, Social Science & Management Course, **BS:** Basic Sciences, **ES:** Engineering Science Course, **PC:** Professional Course, **UV:** Universal Human Value Course, **MC:** Mandatory Course (Non-credit), **AE:** Ability Enhancement Course, **PW:** Project Work/Mini Project, **OE:** Open Elective, **IS:** Internship / Technical Seminar, **NC:** Non-Credit, **PE:** Professional Elective Course, **L:** Lecture, **T:** Tutorial, **P:** Practical, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation.

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I Semester P Cycle

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | Credits | |
|--------------|-------------|-------------|---|---|----------------------|----------|--------------------|-------------------|------------|------------|-----------|-------------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | | Total Marks |
| | | | | | L | T | P | | | | | |
| 1. | AE | 24BEPHY101 | Professional Communication-I | TD: ENGLISH PSB: ENGLISH | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| 2. | BS | 24BEPHY102 | Linear Algebra and Calculus | TD: MATHS PSB: MATHS | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 3. | BS | 24BEPHY103 | Engineering Physics | TD: PHYSICS PSB: PHYSICS | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 4. | ES | 24BEPHY104 | Problem Solving Using C | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 5. | ES | 24BEPHY105 | Computer Organization and Architecture | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 6. | ES | 24BEPHY106 | Fundamentals of AI& ML | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 7. | ES | 24BEPHY107 | Computer Aided Engineering and Graphics | TD: MECH PSB: MECH | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 8. | AE | 24BEPHY108 | Intellectual Property Rights (IPR) | TD: CSE-AIML PSB: CSE-AIML | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| Total | | | | | | | | 400 | 400 | 800 | 22 | |

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II Semester P Cycle

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | | |
|--------------|-------------|-------------|---|---|----------------------|----------|--------------------|-------------------|------------|------------|-------------|---------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | Total Marks | Credits |
| | | | | | L | T | P | | | | | |
| 1. | AE | 24BEPHY201 | Professional Communication-I | TD: ENGLISH PSB: ENGLISH | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| 2. | BS | 24BEPHY202 | Computational Mathematics | TD: MATHS PSB: MATHS | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 3. | BS | 24BEPHY203 | Engineering Physics | TD: PHYSICS PSB: PHYSICS | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 4. | ES | 24BEPHY204 | Problem Solving Using Python | TD: CSE-AIIML PSB: CSE-AIIML | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 5. | ES | 24BEPHY205 | Computer Organization and Architecture | TD: CSE-AIIML PSB: CSE-AIIML | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 6. | ES | 24BEPHY206 | Fundamentals of AI & ML | TD: CSE-AIIML PSB: CSE-AIIML | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 7. | ES | 24BEPHY207 | Computer Aided Engineering and Graphics | TD: MECH PSB: MECH | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 8. | AE | 24BEPHY208 | Intellectual Property Rights (IPR) | TD: CSE-AIIML PSB: CSE-AIIML | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| Total | | | | | | | | 400 | 400 | 800 | 22 | |

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II Semester E Cycle

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | | Credits |
|--------------|-------------|-----------------------------|--|---|----------------------|----------|--------------------|-------------------|------------|------------|-------------|---------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | | | | | |
| 1. | HS | 24BEELY201A/ 24BEELY201B | Kannada Samskruthi/ Kali Kannada | TD: KANNADA PSB: KANNADA | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| 2. | BS | 24BEELY202 | Computational Mathematics | TD: MATHS PSB: MATHS | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 3. | HS | 24BEELY203 | Environmental Science and Engineering | TD: CIVIL PSB: CIVIL | 1 | 0 | 0 | 03 | 50 | 50 | 100 | 1 |
| 4. | ES | 24BEELY204 | Basics of Electrical and Electronics Engineering | TD: ECE PSB: ECE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 5. | ES | 24BEELY205 | Problem Solving Using Python | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 6. | ES | 24BEELY206 | Fundamentals of Data Structure | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 7. | ES | 24BEELY207 | Fundamentals of Data Science | TD: CSE-AIML PSB: CSE-AIML | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 8. | HS | 24BEELY208 | Indian Constitution | TD: CSE-AIML PSB: CSE-AIML | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| Total | | | | | | | | 400 | 400 | 800 | 22 | |

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III SEMESTER

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | Credits | |
|--------------|-------------|-------------|--|---|----------------------|----------|--------------------|-------------------|------------|------------|-----------|-------------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | | Total Marks |
| | | | | | L | T | P | | | | | |
| 9. | BS | 24BEEEE301 | Vector Calculus, Transform Techniques and Fourier Series | TD: Maths PSB: Maths | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 10. | PC | 24BEEEE302 | Electric Circuit Analysis | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 11. | PC | 24BEEEE303 | Analog Electronics circuits | TD: EEE PSB: EEE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 12. | PC | 24BEEEE304 | Transformers and Generators | TD: EEE PSB: EEE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 13. | PC | 24BEEEE305 | Digital system design | TD: EEE PSB: EEE | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 14. | PC | 24BEEEE306 | Measurements and instrumentation | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 15. | PC | 24BEEEE307 | Electrical Power Generation | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 16. | AE | 24BEEEE308 | Cyber Laws and Ethics | TD: CSE PSB: CSE | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| 17. | UV | 24BEEEE309 | Out Reach Activity-I | Any Department | 0 | 0 | 0 | 01 | 100 | --- | 100 | 1 |
| Total | | | | | | | | 500 | 400 | 900 | 25 | |
| 18. | BS | 24BEEEE310 | Maths-Dip (for Lateral entry) | TD: Maths PSB: Maths | 3 | 0 | 0 | 03 | 50 | -- | 50 | - |

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IV SEMESTER

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | | Credits |
|--------------|-------------|-------------|--|---|----------------------|----------|--------------------|-------------------|------------|------------|-------------|---------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | | | | | |
| 9. | BS | 24BEEEEE401 | Numerical Methods, Probability and Statistical Methods | TD: Maths PSB: Maths | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 10. | PC | 24BEEEEE402 | Electric Motors | TD: EEE PSB: EEE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 11. | PC | 24BEEEEE403 | Control Systems | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 12. | PC | 24BEEEEE404 | Microcontroller | TD: EEE PSB: EEE | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 13. | PC | 24BEEEEE405 | Transmission and distribution | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 14. | PC | 24BEEEEE406 | Power Electronics | TD: EEE PSB: EEE | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 15. | PE | 24BEEEEE41X | Professional Elective-I | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 16. | AE | 24BEEEEE407 | Life Skills for Engineers | TD: EEE PSB: EEE | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| 17. | UV | 24BEEEEE408 | Out Reach Activity-II | Any Department | 0 | 0 | 0 | 01 | 100 | --- | 100 | 1 |
| Total | | | | | | | | 500 | 400 | 900 | 24 | |

Professional Elective 1

| | | | | | |
|-------------|------------------------------|-------------|--------------|-------------|-------------------------------|
| 24BEEEEE411 | Electromagnetic Field Theory | 24BEEEEE412 | Op Amp & LIC | 24BEEEEE413 | Sensors and their Application |
|-------------|------------------------------|-------------|--------------|-------------|-------------------------------|

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V SEMESTER

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | | Credits |
|--------------|-------------|-------------|--------------------------------------|---|----------------------|----------|--------------------|-------------------|------------|------------|-------------|---------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | | | | | |
| 9. | PC | 24BEEEE501 | Digital Signal Processing | TD: EEE PSB: EEE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 10. | PC | 24BEEEE502 | Power system Analysis-1 | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 11. | PC | 24BEEEE503 | Fundamentals of Embedded system | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 12. | PC | 24BEEEE504 | Electrical machine Design & Drawing | TD: EEE PSB: EEE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 13. | PE | 24BEEEE52X | Professional Elective-II | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 14. | PE | 24BEEEE53X | Professional Elective-III | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 15. | HS | 24BEEEE505 | Digital Marketing | Any Department | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 16. | PW | 24BEEEE506 | Professional Ethics and Human Values | Any Department | 1 | 0 | 0 | 01 | 50 | 50 | 100 | 1 |
| 17. | NC | 24BEEEE507 | Value Added Program-I | Any Department | 0 | 0 | 0 | 01 | --- | --- | --- | - |
| Total | | | | | | | | 400 | 400 | 800 | 24 | |

Professional Elective - II

| | | | | | |
|------------|--|------------|----------------------|------------|------------------------------|
| 24BEEEE521 | Power electronics for Renewable energy sources | 24BEEEE522 | Fundamentals of VLSI | 24BECSE523 | Switch mode power conversion |
|------------|--|------------|----------------------|------------|------------------------------|

Professional Elective - III

| | | | | | |
|------------|--|------------|----------------------------|------------|-------------------------|
| 24BEEEE531 | Soft Computing for Electrical Applications | 24BEEEE532 | Hybrid Energy Technologies | 24BEEEE533 | Smart System Automation |
|------------|--|------------|----------------------------|------------|-------------------------|

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VI SEMESTER

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | Examination | | | | Credits |
|--------------|-------------|-------------|--------------------------------|---|----------------------|----------|--------------------|-------------------|------------|------------|-------------|---------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | | | | | |
| 9. | PC | 24BEEEE601 | High Voltage Engineering | TD: EEE PSB: EEE | 2 | 0 | 2 | 03 | 50 | 50 | 100 | 3 |
| 10. | PC | 24BEEEE602 | Power System Protection | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 11. | PC | 24BEEEE603 | Power system Analysis -2 | TD: EEE PSB: EEE | 3 | 0 | 2 | 03 | 50 | 50 | 100 | 4 |
| 12. | PC | 24BEEEE604 | Electric Vehicles Technologies | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 13. | PE | 24BEEEE64X | Professional Elective-IV | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 14. | PE | 24BEEEE65X | Professional Elective-V | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 15. | OE | 24BEEEE605 | Management & Entrepreneurship | Any Department | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 16. | PW | 24BEEEE606 | Mini Project | TD: EEE PSB: EEE | 0 | 0 | 0 | 01 | 50 | 50 | 100 | 2 |
| 17. | NC | 24BEEEE607 | Value Added Program-II | TD: EEE PSB: EEE | 0 | 0 | 0 | 01 | --- | --- | --- | - |
| Total | | | | | | | | 400 | 400 | 800 | 24 | |

Professional Elective - IV

| | | | | | |
|------------|-----------------------------------|------------|------------|------------|-----------------------|
| 24BEEEE641 | Industrial Drives and Application | 24BEEEE642 | Smart grid | 24BEEEE643 | Power System Planning |
|------------|-----------------------------------|------------|------------|------------|-----------------------|

Professional Elective - V

| | | | | | |
|------------|----------------------------|------------|------------------------|------------|-----------------------|
| 24BEEEE651 | Electric power utilization | 24BEEEE652 | Estimation and costing | 24BEEEE653 | Energy storage system |
|------------|----------------------------|------------|------------------------|------------|-----------------------|

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VII SEMESTER

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|--------------|-------------|-------------|------------------------------|---|----------------------|----------|--------------------|-------------------|------------|------------|-------------|---------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | | | | | |
| 1. | OE | 24BEEEE7xx | Open Elective/ MOOC/NPTEL-I | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 2. | OE | 24BEEEE7xx | Open Elective/ MOOC/NPTEL-II | TD: EEE PSB: EEE | 3 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 3. | IS | 24BEEEE703 | Summer Internship | - | 0 | 0 | 4 | - | - | 100 | 100 | 2 |
| 4. | IS | 24BEEEE704 | Technical Seminar | - | - | - | - | - | - | 100 | 100 | 1 |
| 5. | PW | 24BEEEE705 | Project Phase-I | - | - | - | - | - | - | 100 | 100 | 3 |
| Total | | | | | | | | 400 | 400 | 800 | 12 | |

Open Elective - I

| | | | | | |
|------------|--------------------------|------------|-------------------------------|------------|------------|
| 24BEEEE711 | Renewable Energy Sources | 24BEEEE712 | Electric Vehicle Technologies | 24BEEEE713 | Smart Grid |
|------------|--------------------------|------------|-------------------------------|------------|------------|

Open Elective - II

| | | | | | |
|------------|-------------------------------|------------|------------------------|------------|------------------------|
| 24BEEEE721 | Energy Conservation and Audit | 24BEEEE722 | Sensors and Automation | 24BEEEE723 | Energy storage systems |
|------------|-------------------------------|------------|------------------------|------------|------------------------|

VIII SEMESTER

| SN | Course Type | Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | | Examination | | | | Credits |
|----|-------------|-------------|------------------|---|----------------------|----------|--------------------|-----|-------------------|-----------|-----------|-------------|---------|
| | | | | | Theory Lecture | Tutorial | Practical/ Drawing | SDA | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | | L | T | P | S | | | | | |
| 1. | PW | 24BEEEE801 | Project Phase-II | | - | - | - | | - | - | 100 | 100 | 9 |

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