

## BTech in Climate Change Curriculum-2025-29

| S.No. | Course Category                                 | Number of Courses | Total Credits | % credits |
|-------|---|-------------------|---------------|-----------|
| 1     | Professional Core Courses                       | 30                | 69            | 42        |
| 2     | Professional electives                          | 6                 | 13            | 08        |
| 3     | Humanities, Social Science including Management | 6                 | 9             | 5         |
| 4     | Basic Science                                   | 11                | 26            | 16        |
| 5     | Engineering Science                             | 9                 | 19            | 12        |
| 6     | Open electives                                  | 4                 | 7             | 4         |
| 6     | Internship/Project work/Skilling courses etc    | 5                 | 22            | 13        |
| 7     | Audit courses                                   | 5                 | 0             | 0         |
|       | <b>TOTAL</b>                                    |                   | 165           | 100       |

## Semester-I

| Sr. No. | Category | Code | Title   | L | T | P | Hrs | C  | Str |
|---------|----------|------|---|---|---|---|-----|----|-----|
| 1       | Audit    | AU01 | Maths - Bridge Course   | 2 | 0 | 0 | 2   | 0  | BC  |
| 2       | Audit    | AU02 | Physics - Bridge Course   | 2 | 0 | 0 | 2   | 0  | BC  |
| 3       | Audit    | AU03 | Chemistry - Bridge Course   | 2 | 0 | 0 | 2   | 0  | BC  |
| 4       | Audit    | AU04 | Environmental Science   | 2 | 0 | 0 | 2   | 0  | EE  |
| 5       | ESC      | ES01 | Engineering Drawing and CAD   | 1 | 0 | 4 | 5   | 3  | ED  |
| 6       | BSC      | BS01 | Climate Physics and Climatology   | 3 | 1 | 0 | 4   | 4  | CS  |
| 7       | BSC      | BS02 | Applied Chemistry   | 2 | 0 | 2 | 4   | 3  | CC  |
| 8       | BSC      | BS03 | Engineering Mathematics-I<br>(Linear algebra, Calculus, Complex number) | 1 | 1 | 0 | 2   | 2  | EM  |
| 9       | PCC      | PC01 | Introduction to Energy Sources  | 1 | 1 | 0 | 2   | 2  | ET  |
| 10      | HSM      | HS01 | Introduction to Economics and Finance                                   | 2 | 0 | 0 | 2   | 2  | CF  |
| 11      | OE-I     | OE-I | Behavioral Science/Design Thinking                                      | 0 | 0 | 2 | 2   | 1  | BS  |
| 12      | BSC      | BS04 | Introduction to Climate Action  | 1 | 1 | 0 | 2   | 2  | TS  |
| 13      | PCC      | PC02 | Applied Research-I  | 0 | 0 | 4 | 4   | 2  | AR  |
| 14      |          |      | Total   |   |   |   | 36  | 21 |     |

**Note: Bridge course (BC) for 2 hours per week in Physics, Chemistry and Math each will also be part of class schedule in first semester.**

## Semester-II

| Sr.N<br>o. | Category | Code | Title   | L | T | P | Hrs | C  | Str |
|------------|----------|------|---|---|---|---|-----|----|-----|
| 1          | BSC      | BS05 | Engineering Mathematics-II (ODE, Numerical methods) | 1 | 1 | 0 | 2   | 2  | EM  |
| 2          | ESC      | ES02 | Design thinking & workshop practice (manufacturing) | 0 | 0 | 4 | 4   | 2  | BS  |
| 3          | PCC      | PC03 | Introduction to Atmospheric Dynamics                | 2 | 0 | 2 | 4   | 3  | CS  |
| 4          | PCC      | PC04 | Engineering Thermodynamic                           | 1 | 1 | 2 | 2   | 2  | EE  |
| 5          | BSC      | BS06 | Atmospheric Chemistry                               | 1 | 0 | 2 | 3   | 2  | CC  |
| 6          | ESC      | ES03 | Basic Electrical and Electronics Engineering        | 1 | 1 | 0 | 2   | 2  | ET  |
| 7          | ESC      | ES04 | Technology & Society-II                             | 1 | 1 | 0 | 2   | 2  | TS  |
| 8          | HSM      | HS02 | Climate Finance-II                                  | 1 | 1 | 0 | 2   | 2  | CF  |
| 9          | ESC      | ES05 | Computer Programming in Python                      | 0 | 0 | 4 | 4   | 2  | EM  |
| 10         | PCC      | PC05 | Applied Research-II                                 | 0 | 0 | 4 | 4   | 2  | AR  |
|            |          |      |   |   |   |   | 29  | 21 |     |

**Internship of 2 credits (4 week) during summer vacation after 2<sup>nd</sup> semester in the institute (to be evaluated in 3<sup>rd</sup> semester)**

### Semester-III

| Sr. No. | Category | Code   | Title   | L | T | P | Hrs | C  | Str |
|---------|----------|--------|---|---|---|---|-----|----|-----|
| 1       | PCC      | PC06   | Environmental Engineering Principles                              | 2 | 0 | 0 | 2   | 2  | EE  |
| 2       | BSC      | BS07   | Engineering Mathematics-III (Statistics and Statistical Methods)  | 1 | 1 | 0 | 2   | 2  | EM  |
| 3       | PCC      | PC07   | Introduction to Numerical Weather Prediction and Climate Modeling | 1 | 1 | 2 | 4   | 3  | CS  |
| 4       | PCC      | PC08   | Heat and Mass Transfer  | 1 | 1 | 2 | 4   | 3  | ET  |
| 5       | PCC      | PC09   | Strength of Materials   | 1 | 1 | 0 | 2   | 2  | BS  |
| 6       | BSC      | BS08   | Bio Chemistry   | 1 | 0 | 2 | 3   | 2  | CC  |
| 7       | ESC      | ES06   | Technology and Society-III  | 1 | 1 | 0 | 2   | 2  | TS  |
| 8       | PCC      | PC10   | Climate Finance-III   | 2 | 0 | 0 | 2   | 2  | CF  |
| 9       | HSM      | HS03   | Universal Human Values-I  | 1 | 0 | 0 | 1   | 1  | BS  |
| 10      | Audit    | AU05   | Sports and Yoga   | 0 | 0 | 2 | 2   | 0  | AU  |
| 11      | PCC      | PC11   | Applied Research-III  | 0 | 0 | 4 | 4   | 2  | AR  |
|         |          |        | Total   |   |   |   | 28  | 21 |     |
| 12      | PROJ     | PROJ01 | Internship presentation   |   |   |   |     | 2  |     |
|         |          |        | Grand Total   |   |   |   |     | 23 |     |

### Semester-IV

| Sr. No. | Category | Code | Title   | L | T | P | Hrs | C  | Str |
|---------|----------|------|---|---|---|---|-----|----|-----|
| 1       | PCC      | PC12 | Life Cycle Analysis                                 | 1 | 0 | 2 | 3   | 2  | EE  |
| 2       | BSC      | BS09 | Engineering Mathematics-IV (PDE, Numerical Methods) | 1 | 1 | 0 | 2   | 2  | EM  |
| 3       | PCC      | PC13 | Materials and Applications                          | 1 | 1 | 0 | 2   | 2  | ET  |
| 4       | PCC      | PC14 | Climate Downscaling and Regional Climate Modeling   | 1 | 0 | 2 | 3   | 2  | CS  |
| 5       | BSC      | BS10 | Microbial Chemistry                                 | 1 | 0 | 2 | 3   | 2  | CC  |
| 6       | PCC      | PC15 | Energy Efficiency                                   | 1 | 0 | 2 | 3   | 2  | ET  |
| 7       | HSM      | HS04 | Universal Human Values-II                           | 1 | 0 | 0 | 1   | 1  | BS  |
| 8       | PCC      | PC16 | Climate Finance-IV                                  | 1 | 1 | 0 | 2   | 2  | CF  |
| 9       | PCC      | PC17 | Applied Research-IV                                 | 0 | 0 | 4 | 4   | 2  | AR  |
| 10      | ESC      | ES07 | Technology and Society-IV                           | 2 | 0 | 0 | 2   | 2  | TS  |
| 11      | HSM      | HS05 | English for Technical Writing                       | 1 | 1 | 0 | 2   | 2  | BS  |
|         |          |      |   |   |   |   | 27  | 21 |     |

Internship of 04 credits (4-6weeks) during summer break after 4<sup>th</sup> semester in industry (to be evaluated in 5<sup>th</sup> semester)

## Semester-V

| Sr. No. | Category | Code   | Title  | L | T | P | Hrs | C  | Str |
|---------|----------|--------|--|---|---|---|-----|----|-----|
| 1       | PCC      | PC18   | Remote Sensing and GIS                         | 1 | 1 | 2 | 4   | 3  | EE  |
| 2       | PCC      | PC19   | Fluid Dynamics                                 | 1 | 1 | 0 | 2   | 2  | EM  |
| 3       | PCC      | PC20   | Climate Scenario Simulation: Biases correction | 2 | 0 | 2 | 4   | 3  | CS  |
| 4       | PCC      | PC21   | Power Plant Engineering                        | 2 | 0 | 2 | 4   | 3  | ET  |
| 5       | PCC      | PC22   | Chemical Technology and Unit Operation         | 1 | 1 | 2 | 4   | 3  | CC  |
| 6       | HSM      | HS06   | Universal Human Values-III                     | 1 | 0 | 0 | 1   | 1  | BS  |
| 7       | PCC      | PC23   | Applied Research-V                             | 0 | 0 | 4 | 4   | 2  | AR  |
| 8       | OE       | OEII   | Climate Finance in India                       | 1 | 1 | 0 | 2   | 2  | CF  |
| 9       | ESC      | ES08   | Technology and Society-V                       | 1 | 1 | 0 | 2   | 2  | TS  |
|         |          |        | Total  |   |   |   | 27  | 21 |     |
| 10      | PROJ     | PROJ02 | Internship presentation                        |   |   |   |     | 04 |     |
|         |          |        | Grand Total                                    |   |   |   |     | 25 |     |

## Semester-VI

| Sr. No. | Category | Code   | Title                                     | L | T | P | Hrs | C  | Str |
|---------|----------|--------|---|---|---|---|-----|----|-----|
| 1       | ESC      | ES09   | AI and ML Application in Climate Modeling | 1 | 1 | 0 | 2   | 2  | EM  |
| 2       | PCC      | PC24   | Sustainable Engineering Practices         | 1 | 1 | 0 | 2   | 2  | EE  |
| 3       | PCC      | PC25   | Applications of Climate Prediction        | 2 | 0 | 2 | 4   | 3  | CS  |
| 4       | PCC      | PC26   | Carbon Capture and Storage                | 2 | 0 | 2 | 4   | 3  | ET  |
| 5       | BSC      | BS11   | Technology and Pollution                  | 2 | 0 | 2 | 4   | 3  | CC  |
| 6       | OE       | OE-III | Sustainable product design                | 1 | 1 | 0 | 2   | 2  | BS  |
| 7       | PCC      | PC27   | Applied Research-VI                       | 0 | 0 | 4 | 4   | 2  | AR  |
| 8       | PE       | PE01   | Program Elective-I                        | 1 | 1 | 0 | 2   | 2  | CF  |
| 9       | OE       | OE-IV  | Open Elective-II                          | 1 | 1 | 0 | 2   | 2  | TS  |
|         |          |        |   |   |   |   | 26  | 21 |     |

**Internship of 04 credits (4-6weeks) during summer vacation after 6<sup>th</sup> semester (to be evaluated in 7<sup>th</sup> semester)**

## SEMESTER-VII: SPECIALISATION

| Student can opt for any one of the following three specialisation |          |         |   |   |   |   |           |         |  |
|---|----------|---------|---|---|---|---|-----------|---------|--|
| 1.Climate in business 2. Climate policy 3. Innovation             |          |         |   |   |   |   |           |         |  |
| Specialisation: Climate in business                               |          |         |   |   |   |   |           |         |  |
| S.No.   | Category | Code    | Course Title                                  | L | T | P | Total Hrs | Credits |  |
| 1   | PCC      | PC27    | Climate & environment regulations             | 2 | 0 | 0 | 2         | 2       |  |
| 2   | PCC      | PC28    | Advanced climate Technologies                 | 1 | 0 | 2 | 3         | 2       |  |
| 3   | PCC      | PC29    | Biodiversity & nature                         | 1 | 0 | 2 | 3         | 2       |  |
| 4   | PE       | PE05    | Sustainability & reporting                    | 1 | 2 | 0 | 3         | 3       |  |
| 5   | PE       | PE06    | Organisational change management              | 1 | 2 | 0 | 3         | 3       |  |
| 6   | PE       | PE07    | Applied Research-supply chain decarbonisation | 1 | 0 | 4 | 5         | 3       |  |
|   |          |         | Total   |   |   |   | 19        | 15      |  |
|   | PROJ     | PROJ 01 | Presentation of Internship work               |   |   |   |           | 4       |  |
|   |          |         | Grand Total                                   |   |   |   |           | 19      |  |
|   |          |         |   |   |   |   |           |         |  |
| Specialisation: Climate Policy                                    |          |         |   |   |   |   |           |         |  |
| S.No.   | Category | Code    | Course Title                                  | L | T | P | Total Hrs | Credits |  |



| 1                          | PCC      | PC27    | Climate & environment regulations           | 2           | 0 | 0 | 2         | 2       |  |
|----------------------------|----------|---------|---|-------------|---|---|-----------|---------|--|
| 2                          | PCC      | PC28    | Advanced climate Technologies               | 1           | 0 | 2 | 3         | 2       |  |
| 3                          | PCC      | PC29    | Biodiversity & nature                       | 1           | 0 | 2 | 3         | 2       |  |
| 4                          | PE       | PE05    | Regional climate laws                       | 1           | 2 | 0 | 3         | 3       |  |
| 5                          | PE       | PE06    | Building negotiation skills                 | 1           | 2 | 0 | 3         | 3       |  |
| 6                          | PE       | PE07    | Drafting climate policies                   | 1           | 0 | 4 | 5         | 3       |  |
|                            |          |         | Total                                       |             |   |   | 19        | 15      |  |
|                            | PROJ     | PROJ 01 | Presentation of Internship work             |             |   |   |           | 4       |  |
|                            |          |         |   | Grand Total |   |   |           | 19      |  |
|                            |          |         |   |             |   |   |           |         |  |
| Specialisation: Innovation |          |         |   |             |   |   |           |         |  |
| S.No.                      | Category | Code    | Course Title                                | L           | T | P | Total Hrs | Credits |  |
| 1                          | PCC      | PC27    | Climate & environment regulations           | 2           | 0 | 0 | 2         | 2       |  |
| 2                          | PCC      | PC28    | Advanced climate Technologies               | 1           | 0 | 2 | 3         | 2       |  |
| 3                          | PCC      | PC29    | Biodiversity & nature                       | 1           | 0 | 2 | 3         | 2       |  |
| 4                          | PE       | PE05    | Innovations in climate related technologies | 1           | 2 | 0 | 3         | 3       |  |

|   |      |         |                                 |             |   |   |    |    |  |
|---|------|---------|---------------------------------|-------------|---|---|----|----|--|
| 5 | PE   | PE06    | Entrepreneurship                | 1           | 2 | 0 | 3  | 3  |  |
| 6 | PE   | PE07    | Applied research-patents and IP | 1           | 0 | 4 | 5  | 3  |  |
|   |      |         | Total                           |             |   |   | 21 | 15 |  |
|   | PROJ | PROJ 01 | Presentation of internship work |             |   |   |    | 4  |  |
|   |      |         |                                 | Grand Total |   |   |    | 19 |  |

Note: Students are free to take up courses in semester 7 that they may have been unable to take or pass in earlier semesters.

## SEMESTER-VIII

| Climate in Business |          |        |  |   |   |   |                                       |         |
|---------------------|----------|--------|--|---|---|---|---------------------------------------|---------|
| S.No                | Category | Code   | Course Title                                 | L | T | P | Total Hrs                             | Credits |
| 1.                  | PROJ     | PROJ02 | Industry project                             |   |   |   | 10 week<br>(410 Hrs) in<br>a semester | 10      |
| 2                   | PROJ     | PROJ03 | Climate communication<br>and professionalism |   |   |   | 84 Hrs                                | 2       |
| 3                   | PE       | PE08   | Strategy and planning for<br>climate action  | 0 | 1 | 0 | 1<br>(16 Hrs in a<br>semester)        | 1       |
| 4                   | PE       | PE09   | Carbon project<br>development                | 0 | 1 | 0 | 1<br>(16 Hrs in a<br>semester)        | 1       |
| Total               |          |        |  |   |   |   | 526 Hrs in<br>entire<br>semester      | 14      |

| Climate Policy |          |        |   |   |   |   |                                       |         |
|----------------|----------|--------|---|---|---|---|---------------------------------------|---------|
| S.No.          | Category | Code   | Course Title                                  | L | T | P | Total Hrs                             | Credits |
| 1.             | PROJ     | PROJ02 | Industry project                              |   |   |   | 10 week<br>(410 Hrs) in<br>a semester | 10      |
| 2              | PROJ     | PROJ03 | Climate communications<br>and professionalism |   |   |   | 84 Hrs                                | 2       |
| 3              | PE       | PE08   | Strategy and planning for<br>climate action   | 0 | 1 | 0 | 1<br>(16 Hrs in a<br>semester)        | 1       |

|       |    |      |             |   |   |   |                             |    |
|-------|----|------|-------------|---|---|---|-----------------------------|----|
| 4     | PE | PE09 | Climate Law | 0 | 1 | 0 | 1<br>(16 Hrs in a semester) | 1  |
| Total |    |      |             |   |   |   | 526 Hrs in entire semester  | 14 |

| Innovation |          |        |   |   |   |   |                                 |         |
|------------|----------|--------|---|---|---|---|---------------------------------|---------|
| S.No.      | Category | Code   | Course Title                              | L | T | P | Total Hrs                       | Credits |
| 1.         | PROJ     | PROJ02 | Industry project                          |   |   |   | 10 week (410 Hrs) in a semester | 10      |
| 2          | PROJ     | PROJ03 | Climate communication and professionalism |   |   |   | 84 Hrs                          | 2       |
| 3          | PE       | PE08   | Strategy and planning for climate action  | 0 | 1 | 0 | 1<br>(16 Hrs in a semester)     | 1       |
| 4          | PE       | PE09   | Financing climate innovation              | 0 | 1 | 0 | 1<br>(16 Hrs in a semester)     | 1       |
| Total      |          |        |   |   |   |   | 526 Hrs in entire semester      | 14      |