



Tulsiramji Gaikwad-Patil College of Engineering and Technology

Wardha Road, Nagpur - 441108

Accredited with NAAC A+ Grade

Approved by AICTE, New Delhi, Govt. of Maharashtra

(An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)

Department of Electronics and Communication Engineering

Scheme of Instructions: Second Year B. Tech. in Electronics and Communication Engineering

Semester – III (As Per NEP 2020)



| Sr. No. | Sem | Type | BoS/ Dept | Sub Code | Subject | T/P | Contact Hours | | | Credits | % Weightage | | | ESE Duration | Total Marks |
|-----------------|-----|------|---|-----------------------------|--|---|----------------------|-----------|-----------|--|-------------------------------|-------------------------------|------------|----------------|-------------|
| | | | | | | | L | P | Hrs. | | CT/A | CA | ESE | | |
| 1 | III | PCC | EC | BEC32301 | Digital System Design with HDL | T | 3 | - | 3 | 3 | 30 | 10 | 60 | 3 Hrs. | 100 |
| 2 | III | PCC | EC | BEC32303 | Electronics Devices & Circuit | T | 3 | - | 3 | 3 | 30 | 10 | 60 | 3 Hrs. | 100 |
| 3 | III | OEC | SH | B\$\$\$23XX | Open Elective-I | T | 4 | - | 4 | 4 | 30 | 10 | 60 | 3 Hrs. | 100 |
| 4 | III | HSSM | BA | BBA32307 | Industrial Relations | T | 2 | - | 2 | 2 | 14 | 6 | 30 | 2 Hrs. | 50 |
| 5 | III | VEC | SH | BSH32308 | Digital Awareness and Cyber Responsibility Lab | T | 2 | - | 2 | 2 | 14 | 6 | 30 | 2 Hrs. | 50 |
| 6 | III | MDM | SH | BSH32305 | Transformation and its series | T | 2 | - | 2 | 2 | 14 | 6 | 30 | 2 Hrs. | 50 |
| 7 | III | PCC | EC | BEC32302 | Digital System Design with HDL Lab | P | - | 2 | 2 | 1 | - | 25 | 25 | 2 Hrs. | 50 |
| 8 | III | PCC | EC | BEC32304 | Electronics Devices & Circuit | P | - | 2 | 2 | 1 | - | 25 | 25 | 2 Hrs. | 50 |
| 9 | III | CEP | EC | BEC32305 | Community Engineering Project | P | - | 4 | 4 | 2 | - | 50 | - | 2 Hrs. | 50 |
| Total | | | | | | | 16 | 08 | 24 | 20 | 132 | 148 | 320 | 21 Hrs. | 600 |
| Course Category | | | BSC/ESC (Basic Science Course/ Engineering Science Course.) | PCC Programme Core Courses) | PEC (Programme Elective Courses) | MDM/OEC Multidisciplinary Minor/ (OEC) Open Elective Course | VSEC/AEC Skill urse) | | | Humanities Social Science & Management | Experiential Learning Courses | CC (Liberal Learning Courses) | | | |
| Credits | | | -- | 08 | - | 06 | -- | | | 04 | 02 | - | | | |
| Cumulative Sum | | | 16/13 | 10 | - | 06 | 04 | | | 08 | 02 | 04 | | | |

Progressive Total Credits: 43+20 = 63

| | | | | | | |
|-------------|----------------|----------------|-----------|-----------------|---------|--|
| | | | | June,2024 | 1.00 | Applicable for AY 2024-25 Onwards for 2023-24 Batch Students |
| Chairperson | Dean Academics | Vice Principal | Principal | Date of Release | Version | |



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Department of Electronics and Communication Engineering



Scheme of Instructions: Second Year B. Tech. in Electronics and Communication Engineering

Semester IV (As Per NEP 2020)

| Sr. No. | Course Category | Course Code | Course Title | T/P | Contact Hrs./Week | | | Credits | Exam Scheme | | | | | ESE Duration |
|--------------|-----------------|-------------|-------------------------------------|-----|-------------------|-----------|-----------|-----------|-------------|-----------|------------|------------|------------|--------------|
| | | | | | L | P | Hrs | | CT-1 | CT-2 | CA | ESE | TOTAL | |
| 1 | PCC | BEC32401 | Analog Circuit Design | T | 3 | 0 | 3 | 3 | 15 | 15 | 10 | 60 | 100 | 3 |
| 2 | PCC | BEC32403 | Signals & Systems | T | 3 | 0 | 3 | 3 | 15 | 15 | 10 | 60 | 100 | 3 |
| 3 | MDM | BIT32416 | Data Structure and Algorithm | T | 2 | 0 | 2 | 2 | 7 | 7 | 6 | 30 | 50 | 2 |
| 4 | OE | BEC32409 | Open Elective-II | T | 2 | 0 | 2 | 2 | 7 | 7 | 6 | 30 | 50 | 2 |
| 5 | HSSM | BBA32401 | Entrepreneurship Development | T | 2 | 0 | 2 | 2 | 7 | 7 | 6 | 30 | 50 | 2 |
| 6 | AEC | BCE32408 | Sustainable Development Goals (SDG) | P | 0 | 4 | 4 | 2 | - | - | 50 | 50 | 100 | 2 |
| 7 | VEC | BSH32404 | Leadership and Team Dynamics | P | 0 | 4 | 4 | 2 | - | - | 50 | 50 | 100 | 2 |
| 8 | PCC | BEC32402 | Analog Circuit Design Lab | P | 0 | 2 | 2 | 1 | - | - | 25 | 25 | 50 | 2 |
| 9 | PCC | BEC32404 | Signals & Systems Lab | P | 0 | 2 | 2 | 1 | - | - | 25 | 25 | 50 | 2 |
| 10 | VSEC | BEC32405 | Software Lab: Java Programming | P | 0 | 4 | 4 | 2 | - | - | 50 | 50 | 100 | 2 |
| Total | | | | | 12 | 16 | 28 | 20 | 51 | 51 | 238 | 410 | 750 | |

| Course Category | BSC/ ESC (Basic Science Course/ Engineering Science Course.) | PCC (Program me Core Courses) | PEC (Programme Elective Courses) | (MDM/OEC) Multidisciplinary Minor/ (OEC) Open Elective Course) | SEC/VSEC (Skill Course) | Humanities Science & Management | Experiential Learning | CC (Cocurricular) |
|-----------------|--|-------------------------------|----------------------------------|--|-------------------------|---------------------------------|-----------------------|-------------------|
| Credits | -- | 08 | -- | 04 | 02 | 06 | - | - |
| Cumulative Sum | 16 / 13 | 18 | -- | 10 | 6 | 14 | 02 | 04 |

Progressive Total Credits: 63+20=83

| | | | | | | |
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Semester V (As Per NEP 2020)



| Sr. No. | Sem | Type | Bos/Dep. | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | | ESE Duration Hours |
|--------------|-----|------|----------|--------------|--|-----|---------------|----------|----------|-----------|-----------|-------------|------------|------------|-------------|--------------------|
| | | | | | | | L | SL | P | Hrs | | CT/IA | CA | ESE | Total Marks | |
| 1 | V | PCC | EC | BEC33501 | Analog & Digital Communication | T | 3 | 0 | 0 | 3 | 3 | 30 | 10 | 60 | 100 | 3 |
| 2 | V | PCC | EC | BEC33502 | Microcontroller and Embedded Systems | T | 3 | 0 | 0 | 3 | 3 | 30 | 10 | 60 | 100 | 3 |
| 3 | V | PCC | EC | BEC33504 | Digital Signal Processing | T | 3 | 0 | 0 | 3 | 3 | 30 | 10 | 60 | 100 | 3 |
| 4 | V | MDM | IT | BIT33517 | Artificial Intelligence | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 5 | V | PEC | EC | BEC33506-8 | Program Elective-I | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 6 | V | OE | XX | B\$\$\$335XX | Open Elective-III | T | 2 | 0 | 0 | 2 | 2 | 14 | 10 | 30 | 50 | 2 |
| 7 | V | PCC | EC | BEC33503 | Microcontroller and Embedded Systems Lab | P | 0 | 0 | 2 | 2 | 1 | 0 | 25 | 25 | 50 | 2 |
| 8 | V | PCC | EC | BEC33505 | Digital Signal Processing Lab | P | 0 | 0 | 2 | 2 | 1 | 0 | 25 | 25 | 50 | 2 |
| 9 | V | PCC | EC | BEC33506 | Analog & Digital Communication | P | 0 | 0 | 2 | 2 | 1 | 0 | 25 | 25 | 50 | 2 |
| Total | | | | | | | 19 | 0 | 6 | 25 | 22 | 180 | 135 | 435 | 750 | |

| Course Category | BSC/ ESC (Basic Science Course/ Engineering Science Course.) | PCC (Program me Core Courses) | PEC (Programme Elective Courses) | (MDM/OEC) Multidisciplinary Minor/ (OEC) Open Elective Course) | SEC/VSEC (Skill Course) | Humanities Science & Management | Experiential Learning | CC (Cocurricular) |
|-----------------|--|-------------------------------|----------------------------------|--|-------------------------|---------------------------------|-----------------------|-------------------|
| Credits | -- | 12 | 04 | 06 | -- | -- | -- | -- |
| Cumulative Sum | 16 / 13 | 30 | 04 | 16 | 06 | 14 | 02 | 04 |

Progressive Total Credits: 83+22= 105

| | | | | | | |
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Semester VI (As Per NEP 2020)



| Sr. No. | Sem | Type | BoS/ Dept | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | | ESE Duration Hours |
|--------------|-----|------|-----------|-------------|------------------------|-----|---------------|----------|----------|-----------|-----------|-------------|------------|------------|-------------|--------------------|
| | | | | | | | L | SL | P | Hrs. | | CT/TA | CA | ESE | Total Marks | |
| 1 | VI | PCC | EC | BEC33601 | Power Electronics | T | 3 | 0 | 0 | 3 | 3 | 30 | 10 | 60 | 100 | 3 |
| 2 | VI | PCC | EC | BEC33603 | Internet of Things | T | 3 | 0 | 0 | 3 | 3 | 30 | 10 | 60 | 100 | 3 |
| 3 | VI | MDM | IT | BIT33617 | Machine Learning | T | 2 | 0 | 0 | 2 | 2 | 14 | 6 | 30 | 50 | 2 |
| 4 | VI | PEC | EC | BEC33605-07 | Program Elective-II | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 5 | VI | PEC | EC | BEC33608-10 | Program Elective-III | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 6 | VI | PCC | EC | BEC33602 | Power Electronics Lab | P | 0 | 0 | 2 | 2 | 1 | 0 | 25 | 25 | 50 | 2 |
| 7 | VI | PCC | EC | BEC33604 | Internet of Things Lab | P | 0 | 0 | 2 | 2 | 1 | 0 | 25 | 25 | 50 | 2 |
| 8 | VI | VSEC | IT | BIT33618 | Python Programming | P | 0 | 0 | 4 | 4 | 2 | 0 | 50 | 50 | 100 | 2 |
| Total | | | | | | | 16 | 0 | 8 | 24 | 20 | 134 | 146 | 370 | 650 | |

| Course Category | BSC/ESC (Basic Science Course/ Engineering Science Course.) | PCC (Program me Core Courses) | PEC (Programme Elective Courses) | (MDM/OEC) Multidisciplinary Minor/(OEC) Open Elective Course) | SEC (Skill Course) | Humanities Social Science & Management | Experiential Learning Courses | CC (Co-Curricular Courses) |
|-----------------|---|----------------------------------|-------------------------------------|--|--------------------|--|-------------------------------|----------------------------|
| Credits | -- | 08 | 08 | 02 | 02 | -- | -- | -- |
| Cumulative Sum | 16 / 13 | 38 | 12 | 18 | 08 | 14 | 02 | 04 |

Progressive Total Credits: 105+20 = 125

| | | | | | | |
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Department of Electronics and Communication Engineering

Scheme of Instructions: Fourth Year B. Tech. in Electronics and Communication Engineering

Semester VII (As Per NEP 2020)



| Sr. No. | Sem | Type | BoS/ Dept | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | Total Marks | ESE Duration Hours |
|--------------|-----|---------|-----------|-------------|-------------------------------------|-----|---------------|----------|-----------|-----------|-----------|-------------|------------|------------|-------------|--------------------|
| | | | | | | | L | SL | P | Hrs. | | CT/IA | CA | ESE | | |
| 1 | VII | PCC | EC | BEC34701 | Computer Communication Networks | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 2 | VII | PCC | EC | BEC34702 | Wireless Sensor Network | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 3 | VII | PEC | EC | BEC34703-05 | Program Elective -IV | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 4 | VII | PEC | EC | BEC34706-08 | Program Elective -V | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 5 | VII | MDM | EC | BDS347 | Data Science | T | 3 | 0 | 0 | 3 | 3 | 30 | 10 | 60 | 100 | 3 |
| 6 | VII | MDM | EC | BDS347 | Data Science Lab | P | 0 | 0 | 2 | 2 | 1 | 0 | 25 | 25 | 50 | 2 |
| 7 | VII | PCC | EC | BEC34709 | Computer Communication Networks Lab | P | 0 | 0 | 2 | 2 | 1 | 0 | 25 | 25 | 50 | 2 |
| 8 | VII | Project | EC | BEC34710 | Project | P | 0 | 0 | 8 | 8 | 4 | 0 | 100 | 100 | 200 | 2 |
| Total | | | | | | | 19 | 0 | 12 | 31 | 25 | 150 | 200 | 450 | 800 | 21 |

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|-----------------|---|-------------------------------|----------------------------------|--|--------------------|--|-------------------------------|----------------------------|
| Credits | -- | 09 | 08 | 04 | - | -- | 04 | -- |
| Cumulative Sum | 16 / 13 | 47 | 20 | 22 | 08 | 14 | 06 | 04 |

Progressive Total Credits: 125 + 25 = 150

| | | | | | | |
|-------------|--------------------------------------|---------------------------|-----------|-----------------|---------|--|
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Department of Electronics and Communication Engineering



Scheme of Instructions: Fourth Year B. Tech. in Electronics and Communication Engineering

Semester VIII (As Per NEP 2020)

| SN | Sem | Type | BoS/ Dept | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | | ESE Duration Hours |
|--------------|------|------------------------------|-----------|-----------|-------------------------------|-----|---------------|----------|-----------|-----------|-----------|-------------|------------|------------|-------------|--------------------|
| | | | | | | | L | SL | P | Hrs. | | CT/A | CA | ESE | Total Marks | |
| 1 | VIII | RM | EC | BEC34801 | Research Methodology (Online) | T | 4 | 0 | 0 | 4 | 4 | 30 | 10 | 60 | 100 | 3 |
| 2 | VIII | Internship/ Industry Project | EC | BEC34802 | Internship | P | 0 | 0 | 24 | 24 | 12 | 0 | 100 | 100 | 200 | - |
| Total | | | | | | | 4 | 0 | 24 | 28 | 16 | 30 | 110 | 160 | 300 | 3 |

| Course Category | BSC/ ESC (Basic Science Course/ Engineering Science Course.) | PCC (Program me Core Courses) | PEC (Programme Elective Courses) | (MDM/OEC) Multidisciplinary Minor/ (OEC) Open Elective Course) | SEC (Skill Course) | Humanities Social Science & Management | Experiential Learning Courses | CC (Co-Curricular Courses) |
|-----------------|--|-------------------------------|----------------------------------|--|--------------------|--|-------------------------------|----------------------------|
| Credits | -- | - | - | - | - | -- | 16 | -- |
| Cumulative Sum | 16 / 13 | 47 | 20 | 22 | 08 | 14 | 22 | 04 |

Progressive Total Credits: 150 +16 = 166

| | | | | | | |
|-------------|--------------------------------------|---------------------------|-----------|-----------------|---------|--|
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Program Elective List for U.G.

| Semester V | Semester VI | |
|--|--|---|
| Program Elective- I | Program Elective- II | Program Elective- III |
| BEC3506: Electromagnetic Field and Antenna | BEC33605: Microwave & Radar Engineering | BEC33608: Wave guide & Antenna |
| BEC3507: CMOS VLSI Design | BEC33606: Digital Design | BEC33609: VLSI Signal Processing |
| BEC3508: Instrumentation and Control System | BEC33607: PLC Fundamental | BEC33610: SCADA |

| Semester VII | Semester VII |
|--|--|
| Program Elective- IV | Program Elective- V |
| BEC34703: Optical Fiber Communication | BEC34806: Mobile Communication |
| BEC34704: Mixed Signal Design | BEC34807: VLSI Testing |
| BEC34705: Robotics & Automation | BEC34808: Distributed Control Systems |

Open Elective List for U.G.

| Open Elective-I (SEM-III) | | | Open Elective-II (SEM-IV) | | |
|---------------------------|-------------|-------------------------------------|---------------------------|-------------|---|
| Sr. No | Course code | Course | Sr. No | Course code | Course |
| 1 | BSS323XX | Basic Electronics and Communication | 1 | BSS324XX | Evolution in Communication Technologies |



| Open Elective-III (SEM-V) | | |
|---------------------------|-------------|---------------------|
| Sr. No | Course code | Course |
| 1 | BSS335XX | ICT in Rural Sector |