

# Curriculum Structure for Honors (**Research**)

(In light of NEP 2020)

*(NEP\_Version II)*



**Offered By**  
**Department of Electronics & Telecommunication Engineering**

**For students admitted in 2023-24 onwards**

**Government College of Engineering, Amravati**  
(An Autonomous Institute of Government of Maharashtra)  
Near Kathora Naka, Amravati, Maharashtra  
PIN 444604  
[www.gcoea.ac.in](http://www.gcoea.ac.in)



**A. Preamble:**

In accordance with the National Education Policy (NEP) 2020, which emphasizes inquiry-driven, discovery-oriented, and research-based learning, the **Honors with Research** track is designed to cultivate a strong foundation in academic research among undergraduate students. This initiative aims to nurture critical thinking, analytical reasoning, and independent inquiry—skills essential for innovation, higher studies, and impactful contributions to society.

The Honors with Research program provides a structured yet flexible framework for students to engage in meaningful research under the mentorship of faculty guides. It is open to academically motivated students who wish to explore advanced topics beyond the regular curriculum and contribute to the body of knowledge in their field

**B. Honors with Research Course skill set**

1. Research Literacy and Analytical Thinking: *This skill set empowers students to think deeply, question assumptions, and approach problems with a research-oriented mindset.*
2. Scientific Communication and Scholarly Writing: *This skill set ensures students can articulate complex ideas clearly and contribute meaningfully to academic and professional discourse.*
3. Project Management and Innovation Readiness: *This skill set prepares students to lead research-driven initiatives in academia, industry, or entrepreneurial ventures.*

**C. Program-Specific Outcomes For Honors with Research**

PSO1: Research and Analytical Proficiency: Demonstrate the ability to conceptualize, design, and execute research projects by applying critical thinking, literature analysis, and data-driven methodologies to solve complex engineering problems. *Aligned with Graduate Attributes: Problem Analysis, Investigation, Modern Tool Usage*

PSO2: Scholarly Communication and Ethical Research Practice: Effectively communicate research findings through academic writing and presentations, while adhering to ethical standards in citation, publication, and collaborative inquiry. *Aligned with Graduate Attributes: Communication, Ethics, Individual and Team Work*

PSO3: Innovation, Project Management, and Lifelong Learning: Apply project management principles, interdisciplinary collaboration, and innovative thinking to carry out research with real-world relevance, while engaging in continuous learning through scholarly exploration. *Aligned with Graduate Attributes: Project Management and Finance, Lifelong Learning, Environment and Sustainability*

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**D. Eligibility criteria:** Students with minimum **CGPA of 7.5** without backlog courses at the end of fourth semester and should have earned from 1 to 4 Sem total mentioned credits are eligible for admission to the UG Bachelor's Degree with Honours/ Research/ Double Minor. Courses under this category must be completed in online mode through SWAYAM/ NPTEL or equivalent platform which provides evaluation mechanism. Credits/Marks Obtained under this category are directly mapped to mention teaching evaluation scheme. At the time of registration, if mention course is not available on SWAYAM/ NPTEL or equivalent platform, then DFB will provide available alternative/equivalent course.

**E. Structure of the Honors course:**

<b>E&amp;Tc Department offer Honors (Research)</b>														
Category	Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
							Theory				Practical		Total	
			TH	TU	PR	Total	CT1	CT2	TA	ESE	ICA	ESE		
PER1	ET1531	Research Project Stage 1	00	00	08	08	00	00	100	00	100	000	100	4
PER2	ET1631	Research Project Stage 2	00	00	12	12	00	00	00	00	100	100	200	6
PER3	ET1731	Research Project Stage 3	00	00	16	16	00	00	00	00	100	200	300	8
<b>Total</b>			--	--	--	--	--	--	--	--	--	--	800	18

**F. Career Pathways:** Graduates will be equipped for roles in:

- Academic and Research Careers: *This pathway is ideal for students passionate about deep inquiry, academic excellence, and contributing to the advancement of knowledge through research and teaching.*
- Industry R&D: *This track suits students aiming to work in cutting-edge industrial environments where research fuels innovation, product design, and strategic decision-making.*
- Entrepreneurship and Policy Research: *This pathway is for students with an entrepreneurial mindset or interest in applying research to solve societal problems, influence policy, or launch technology ventures.*

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## Sample Guidelines for the Honour (Research) Project

The purpose of this course is to introduce students to the process of conducting research projects/work. The students will be helped to conceptualize, design and execute a research project by a teacher guide.

### Stage-1:

- Student have to complete online course related to topic/perquisite course prescribed by the assigned guide/BOS

#### OR

- The focus will be on discussions and analysis of assignments. Learners will be encouraged to read books and research journals related to his/her research topic (literature review, theory and hypotheses etc) and share them in the seminars and evaluated by two member Team of department and same to be enter in ICA format.

### Stage-2:

Sample steps:

- Research design/Methodology
- Sampling tool of data collection
- data processing and analysis
- Plan of research report
- Publish review paper in peer view journal/Scopus indexed journal and seminar on it
- The faculty supervisor will assess the method and procedures used by the learner
- At end evaluated by two member Team of department

### Stage-3:

- If applicable initiate Actual implementation
- Data Analysis and Interpretation: The outcome of the research is presented in tabular form with the help of statistical procedures. The data are analyzed and interpreted and presented in the form of a research report and presentation /seminar.
- Report writing
- Publish paper on findings in peer view journal/Scopus indexed journal.
- Two member Team of department will assess the Findings method and procedures
- The faculty supervisor will assess the presentation of major findings depending on the methodology used, presentation of results, interpretation of the results with discussion, summary of the proposed research problem and conclusion.
- Two member Team of department (may evaluated by Guide and external expert) will assess the Findings method and procedures etc

**Note :** Guide Teaching load : 4 Hrs per student in Research stage -1 /2/3

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Course Code				ET1531					Course Category			PER
Course Name				RESEARCH PROJECT STAGE – I								
Teaching Scheme				Examination Scheme							Credits	
Th	Tu	Pr	Total	Theory					Practical			Total
				CT-I	CT-II	TA	ESE	ESE Duration	ICA	ESE		
00	00	08	08	00	00	00	00	--	100	00	100	04

**Course Objectives:** Students undergoing this course are expected to

- I. Gain domain specific knowledge by completing the specific course
- II. Collecting information on novel and latest development in the specific area of the Electronics and Telecommunication Engineering.
- III. Formulating specific problem statement and design a suitable solution methodology for the problem
- IV. Develop project management and teamwork skills by planning, executing, and presenting research findings effectively.

**Course Contents:**

At the beginning of V- semester, just before the commencement of classes, eligible students can register for the B. Tech. with Honours (Research). The research topic/area selected should have relevance to social needs of society and needs of the industry.

Registered Student will have to discuss with his/her respective guide about the specific area for carrying out the research work. He/she will have to complete the theory courses through online platform such as MOOCs, NPTEL etc. as prescribed by the guide/supervisor. Student will have to

- (i) Formulate the specific problem statement,
- (ii) Carry out the research literature survey for acquiring in depth knowledge in the chosen domain.
- (ii) Design a suitable solution methodology for the problem,
- (iv) Share the details of literature survey, hypothesis, etc. with the guide.

Student will be required to deliver the seminar on the literature survey and proposed research topic at the end of V-semester.

**Internal Continuous Assessment (ICA):** Student will be required to deliver a seminar based on the work carried out. The ICA includes the assessment on the basis of seminar to be evaluated by the three-member committee constituted by the Head of Department.

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**Course Outcomes:**

After completion of the course, the students will be able to:

**ET1531.1** Plan an investigative research problem

**ET1531.2** Apply the in-depth knowledge gained in the domain area such as existing methods and their limitations, etc. through literature survey and course attended.

**ET1531.3** Formulate suitable solution methodology for the research problem

**CO-PO-PSO Mapping as per NBA Jan -2016 Format**

CO	PO / PSO														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ET1531.1	2	3	3	0	0	0	0	0	0	0	2	0	0	2	0
ET1531.2	2	0	0	2	3	0	0	0	3	0	0	2	0	0	0
ET1531.3	3	0	3	3	0	2	2	0	0	0	0	0	0	2	3

0 - Not correlated    1 - Weakly Correlated    2 - Moderately Correlated    3 - Strongly Correlated

**CO-PO-PSO Mapping as per NBA 1-Jan-2025 Format**

CO	PO/PSO														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	
ET1531.1	2	3	3	0	0	0	0	0	0	0	2	0	2	0	
ET1531.2	2	0	0	2	3	0	0	3	0	2	0	0	0	0	
ET1531.3	3	0	3	3	0	2	2	0	0	0	0	0	2	3	

0 - Not correlated    1 - Weakly Correlated    2 - Moderately Correlated    3 - Strongly Correlated

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Course Code				ET1631					Course Category			PER
Course Name				RESEARCH PROJECT STAGE – II								
Teaching Scheme				Examination Scheme							Credits	
Th	Tu	Pr	Total	Theory					Practical			Total
				CT-I	CT-II	TA	ESE	ESE Duration	ICA	ESE		
--	--	12	12	--	--	--	--	--	100	100	200	06

**Course Objectives:** Students undergoing this course are expected to

- I. Research design, including the sampling size and techniques
- II. Relevant data and analyze it using modern data processing tools/Carry out experimentation.
- III. Improving the ability of presentation skill and communication techniques

**Course Contents:**

Prepare the research design, including the sampling size and techniques and the statistical tools for the analysis of for the research topic decided in Stage-I (V Semester).

Collect the relevant data, analyze and interpret the same using modern data processing tool, and test the hypotheses if necessary.

Develop a plan for preparing a report. Publish review paper in peer view journal/Scopus indexed journal.

The faculty supervisor will assess the method and procedures used by the learner.

**Internal Continuous Assessment (ICA):**

At the end of semester, the work carried shall be evaluated by three-member committee constituted by Head of Department.

**End Semester Examination (ESE):**

The internal and external examiner appointed by the competent authority will assess the research work carried out by the student through oral presentation and demonstration (if any).

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**Course Outcomes:**

After completion of the course, the students will be able to:

ET1631.1 Analyze and interpret data to produce useful information.

ET1631.2 Show in-depth skill to use some laboratory, modern tools and techniques.

ET1631.3 Communicate results, concepts, analyses and ideas in written and oral form.

**CO-PO-PSO Mapping as per NBA Jan-2016 Format**

CO	PO / PSO														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ET1631.1	0	3	3	3	0	0	2	3	0	0	2	2	0	2	0
ET1631.2	3	0	0	0	3	0	0	0	0	0	0	3	3	0	0
ET1631.3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3

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**CO-PO-PSO Mapping as per NBA 1-Jan-2025 Format**

CO	PO / PSO													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
ET1622.1	0	3	3	3	0	0	3	0	0	2	2	0	2	0
ET1622.2	3	0	0	0	3	0	0	0	0	3	0	3	0	0
ET1622.3	0	0	0	0	0	0	0	0	3	0	0	0	0	3

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Course Code				ET1731					Course Category			PER
Course Name				RESEARCH PROJECT STAGE – III								
Teaching Scheme				Examination Scheme								Credits
Th	Tu	Pr	Total	Theory					Practical		Total	
				CT-I	CT-II	TA	ESE	ESE Duration	ICA	ESE		
--	--	16	16	--	--	--	--	--	100	200	300	08

**Course Objectives:** Students undergoing this course are expected to

- I. Research design, Data Analysis and Interoperation
- II. Relevant data and analyze it and report writing
- III. Improving the ability of presentation skill while writing paper for publication.

Course Content:

- If applicable initiate Actual implementation
- Data Analysis and Interpretation: The outcome of the research is presented in tabular form with the help of statistical procedures. The data are analyzed and interpreted and presented in the form of a research report and presentation /seminar.
- Report writing
- Publish paper on findings in peer view journal/Scopus indexed journal.

ICA

- Two member Team of department will assess the Findings method and procedures
- The faculty supervisor will assess the presentation of major findings depending on the methodology used, presentation of results, interpretation of the results with discussion, summary of the proposed research problem and conclusion.
- Two member Team of department (may evaluated by Guide and external expert) will assess the Findings method and procedures etc

End Semester Examination (ESE):

The internal and external examiner appointed by the competent authority will assess the research work carried out by the student through oral presentation and demonstration (if any).

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