# DIGBOI COLLEGE (AUTONOMOUS)

# ডিগবৈ মহাবিদ্যালয় (স্বায়ত্তশাসিত)

SYLLABUS FRAMED ACCORDING TO THE NATIONAL
EDUCATIONAL POLICY (NEP 2020)

## DEPARTMENT OF ECONOMICS

School of Humanities and Social Science

(Effective from Academic Year 2025-26)

for

Bachelor of Arts



ESTD 1965

# 1. Preamble

Established in 1965, Economics Department, Digboi College (Autonomous) is one of the pioneering department that stands as a beacon of intellectual pursuit and transformative education in Northeast India, guided by the timeless principle "विद्याददाविविनयम्"—knowledge brings humility. As a part of autonomous institution, it embraces the National Education Policy (NEP) 2020 to redefine higher education through a forward-looking, multidisciplinary framework that prepares students to thrive in an interconnected and rapidly evolving global landscape. Our vision is to emerge as a centre of excellence, fostering innovation, critical inquiry, and ethical leadership, while our mission is to empower learners with knowledge, skills, and values that transcend disciplinary boundaries, enabling them to contribute meaningfully to society and the world.

Rooted in a legacy of academic rigor and community engagement, Economics Department, Digboi College aspires to cultivate a dynamic learning ecosystem that integrates the humanities, sciences, commerce and vocational into a cohesive educational experience. We are committed to nurturing graduates who are not only proficient in their chosen fields but also adaptable, socially responsible, and equipped to address contemporary challenges such as sustainability, technological advancements, and cultural diversity. This commitment is realized through a curriculum that blends theoretical depth with practical application, offering students opportunities for research, entrepreneurship, and real- world problem-solving through internships, projects, and industry partnerships.

In alignment with NEP 2020, the Four-Year Undergraduate Programme (FYUGP) at Economics Department, Digboi College embodies academic flexibility, inclusivity and innovation. It provides multiple entry and exit options, interdisciplinary learning pathways, and the Academic Bank of Credits (ABC) to ensure seamless educational mobility and lifelong learning. Our faculty, comprising distinguished educators, researchers and industry practitioners are dedicated to fostering an environment of intellectual curiosity, ethical integrity and collaborative spirit. By leveraging cutting-edge pedagogy, digital resources, and global perspectives, we aim to bridge the gap between academia and the demands of the 21st-century workforce.

Economics Department, Digboi College (Autonomous) envisions itself as a catalyst for regional and national development, producing graduates who are torchbearers of progress—thought leaders, innovators, and compassionate citizens. We strive to uphold the highest standards of academic excellence, comparable to institutions of eminence worldwide, while remaining deeply connected to our cultural heritage and societal needs. Through this FYUGP framework, we pledge to:

- Promote Multidisciplinary Excellence by encouraging holistic learning across Humanities and Social Sciences to develop well-rounded individuals.
- Foster Innovation and Research by cultivating a research-driven culture that addresses local and global challenges.
- Champion Ethical and Sustainable Practices by instilling values of integrity, social responsibility and environmental stewardship.
- Enhance Employability and Entrepreneurship by equipping the students with skills and mindsets to lead in diverse professional arenas.
- Strengthen Community and Global Ties by building bridges with industries, communities and international institutions for impactful collaboration.

Our pledge reflects our unwavering dedication to shaping a future where education is a transformative force, empowering students to excel as scholars, professionals and agents of positive change in an increasingly complex world. Economics Department, Digboi College (Autonomous) stands poised to lead this journey, blending tradition with innovation, and knowledge with purpose, as we prepare the next generation to shape the destiny of our nation and beyond.

## 2. Objectives of the Four-Year Undergraduate Programme (FYUGP)

The FYUGP of Economics Department, Digboi College (Autonomous) aims to provide a transformative, flexible, and holistic educational experience that empowers students to excel in a dynamic global landscape. The broad objectives of the FYUGP are to:

(i) **Promote Multidisciplinary Learning**: Foster an integrated academic experience across Humanities and Social Sciences to develop versatile, well-rounded individuals capable of addressing complex challenges.

(ii) **Enhance Critical Thinking and Innovation**: Cultivate analytical skills, research aptitude, and creative problem-solving through inquiry-based learning and hands-on experiences.

(iii) **Develop Employability and Entrepreneurial Skills**: Equip the students with industry-relevant competencies, practical exposure, and entrepreneurial mindsets through internships, projects, and skill enhancement courses.

(iv) **Instil Ethical and Social Responsibility**: Nurture values of integrity, sustainability, and civic engagement, enabling students to contribute meaningfully to society and uphold cultural heritage.

(v) **Ensure Academic Flexibility and Lifelong Learning**: Provide multiple entry/exit options, credit transfer through the Academic Bank of Credits (ABC) and access to online learning platforms to support continuous personal and professional growth.

(vi) **Foster Global Competence and Collaboration**: Prepare students for diverse professional environments by integrating global perspectives, interdisciplinary collaboration, and industry-community linkages.

# 3. Definitions

- ✓ **Academic Credit:** A unit measuring coursework; 1 credit = 1 hour of lecture/tutorial or 2 hours of practical/fieldwork per week over a duration of 15 weeks per semester.

- ✓ **Major: Core** courses providing foundational and advanced knowledge

- ✓ **Minor:** A secondary discipline enhancing knowledge beyond the major

- ✓ **Discipline-Specific Elective (DSE):** Specialized elective courses within the major discipline.

- ✓ **Multi-Disciplinary Course (MDC):** Interdisciplinary courses from other fields to broaden exposure.

- ✓ **Skill Enhancement Course (SEC):**Practical courses for industry-relevant skills.

- ✓ **Internship/Apprenticeship/Project/Community Outreach (IAPC):** Hands-on experience bridging theory and practice. A structured 6–8-week program that provides hands-on industry exposure, research opportunities, and social engagement to bridge academia and practice.

- ✓ **Academic Year:** Two semesters spanning 12 months.

- ✓ **Semester:** A half-yearly period (15 weeks of instruction, plus exams and breaks).

- ✓ **Academic Bank of Credits (ABC):** A digital mechanism for credit accumulation and transfer across HEIs.

- ✓ **Semester Duration:** A semester normally extends over a period of 15 class weeks, with each week consisting of 30 hours of instruction.

- ✓ **National Education Policy (NEP 2020)**–A transformative framework for higher education emphasizing flexibility, multidisciplinary learning, skill development, and research-driven education.

- ✓ **Credit transfer:** 'Credit transfer' means the mechanism by which the eligible HEIs registered with ABC are able to receive or provide prescribed 'credits' to individual registered ABC account in adherence to the UGC credit norms for the 'course/s' registered by the desirous students in any HEIs within India.

- ✓ **Credit Accumulation:** Students can earn and collect academic credits from different institutions in their **Academic Bank of Credit (ABC)** account. These credits can be used later to complete certificates, diplomas, or degrees.

- ✓ **Academic Flexibility:** Academic flexibility allows students to choose and combine different courses and programs. It provides options for multiple entries and exits, breaking rigid course structures and promoting lifelong learning.

- ✓ **Program Outcomes (PO)**: Broad, overarching goals of the entire FYUGP,

reflecting the knowledge, skills, and attitudes students gain across disciplines.

✓ **Program-Specific Outcomes (PSO)**: Specialized objectives tied to the major discipline detailing expertise and competencies in that field.

✓ **Course Outcomes (CO)**: Specific, measurable objectives for individual courses, outlining what students will achieve upon completion.

✓ **Learning Outcomes (LO)**: Practical, observable skills and knowledge students demonstrate, applied in real-world or professional contexts.

✓ **Credit Accumulation:** Students can earn and collect academic credits from different institutions in their **Academic Bank of Credit (ABC)** account. These credits can be used later to complete certificates, diplomas, or degrees.

✓ **Credit Accumulation from Online Courses (MOOCs):** Students can take online courses from **SWAYAM, Infosys Springboard**, or other UGC-approved platforms.

✓ **Credit Recognition:** Credits earned from partnered universities or colleges are officially recorded in the ABC account, allowing students to use them towards their degrees.

✓ **Credit Redemption:** When students have requisite credits in their ABC account, they can use them to meet the requirements for a certificate, diploma, or degree.

✓ **Semester Duration**:
  o **Odd Semesters**: July–December (including end-semester examinations and semester breaks)
  o **Even Semester**: January-June (including end-semester examinations and semester breaks) Any change in the Academic Calendar/Schedule may be made by the College whenever necessary.

✓ **Credit system:** A 'credit' is a unit that measures coursework, based on the number of instruction hours required per week over a semester (minimum 15 weeks). The credit system includes different instructional components such as lectures, tutorials, practical work, seminars, internships, and experiential learning.

| | | | | |
|---|---|---|---|---|
| **1** | Lecture | 1Hour | 15 Hours | 1 |
| **2** | Tutorial | 1Hour | 15 Hours | 1 |
| **3** | Practicum, LaboratoryWork, Seminar/Group Discussion | 2Hours | 30 Hours | 1 |
| **4** | Experiential Learning, Internship, Community Engagement & Services, Field Visit/Industrial Visit, Studio Activities,Field Practices/Projects, etc. | 2Hours | 30 Hours | 1 |

# 4. Graduate Attributes

Graduate attributes reflect the qualities, skills and competencies that students of Digboi College (Autonomous) will develop upon completing the FYUGP. These attributes align with the institution's commitment to academic excellence, ethical leadership, and societal impact, ensuring that graduates are prepared for professional success and lifelong learning.

### a) Disciplinary Knowledge

Being able to demonstrate thorough knowledge and coherent understanding of the theoretical as well as applied aspects of Economics along with the interdisciplinary fields of study that have been chosen in a broad multidisciplinary context; being able to link relevant disciplines and modern innovations with the learning disciplines of choice.

### b) Critical Thinking

Ability to identify gaps and logical flaws in arguments; Capability to analyse and synthesise theoretical and applied problems; Capability to acquire knowledge and skills through logical reasoning, analytical thinking, and evaluations; instill a positive outlook on lifelong learning.

### c) Problem Solving

Ability to work independently and conduct extensive research to identify how Economics is used in various facets of life; ability to use creative and innovative thinking and interpersonal skills; ability to

take on a variety of challenges in both familiar and unfamiliar settings, and apply what they have learned to real-world scenarios.

### d) Communication Skills

The ability to use mathematics, statistics, and econometrics effectively as precise languages of communication in Economics; the ability to clearly communicate a variety of economic concepts through computation, graphics, examples, and their geometrical representations; the capacity to pay close attention, read texts and research papers critically; and the capacity to communicate complex information clearly and concisely in a variety of settings.

### e) Research Related Skills

The capacity to develop methodology and research proposals, or to be specific, the capacity to develop pertinent research questions and hypotheses for various branches of Economics as well as other related disciplines; the capacity to present findings, theories, methods, and proofs using knowledge from various branches of Economics and other related disciplines.

### f) Reflective Thinking

Understanding how a researcher/investigator makes use of the information one collects; the capacity to formulate pertinent inquiries regarding the relevant issues in different branches of Economics for inventing and discovering new solutions using the domain knowledge of Economics; the capacity to interpret the findings and use them to solve a variety of problems in various fields of Economics as well as in real-life situations.

### g) Information/Digital Literacy

The capacity to use information and communication technology (ICT) tools and to

access, evaluate and utilize these tools. Ability of comprehending, reading and using computational methods in relevant disciplines.

### h) Moral and Ethical Awareness/Reasoning

Ability to recognise ethical issues that are important to one's work and to pledge not to act unethically, such as with plagiarism, copyright infringements, or other violations of intellectual property rights; ability to appreciate recent advancements in various fields with honesty and integrity in all aspects.

### i) Multicultural Competence

Capability to collaborate research in various fields of Economics with other researchers from a variety of backgrounds and organizations; capability of effective cooperation and participation in a multicultural setting and effective interaction with diverse groups; knowledge of the values and beliefs of multiple cultures; and a global view to honour diversity.

### j) Cooperation/Team Work

Capacity to work effectively and respectfully with diverse teams; ability to work with individuals from different backgrounds in the interests of a common objective.

### k) Programme Outcomes (POs):

After completion of this programme -

**PO1-**Critical Thinking: Graduates will be able to critically analyze economic theories and models, apply logical reasoning, and understand their implications in real-world contexts.

**PO2-**Problem Solving: Graduates will acquire enhanced problem-solving skills by applying economic principles and quantitative techniques to address economic issues and policy challenges.

**PO3-**Effective Communication: Graduates will be able to communicate economic concepts, theories, and findings clearly and effectively.

**PO4-**Research and Analytical Skills: Graduates will be able to formulate research proposals, specifically to craft relevant research questions and hypotheses; present findings, theories, methods, and proofs utilizing knowledge from multiple branches of Economics and associated fields.

**PO5-**Technological Proficiency: Graduates will be proficient in using modern technological tools and software for economic analysis, data management, and presentation.

**PO6-**Ethical Awareness: Graduates will be able to apply ethical principles in economic decision-making, recognizing the societal and environmental impacts of economic activities.

**PO7-**Global Perspective: Graduates will develop a global outlook on economic issues, understanding the interconnectedness of economies and the implications of global economic policies and events.

**PO8-**Lifelong Learning: Graduates will foster a commitment to continuous learning and staying updated with the latest developments in the field of economics.

**PO9-**Interdisciplinary Knowledge: Graduates will be able to integrate knowledge from various disciplines such as statistics, mathematics, political science, sociology, history etc. to provide a comprehensive understanding of economic phenomena.

**PO10-**Leadership and Teamwork: Graduates will cultivate leadership qualities and the ability to work collaboratively in diverse teams to address complex economic problems.

## 5. Programme Specific Outcomes (PSOs):

The programme specific outcomes of the Undergraduate Programme in Economics are listed below. After completing the programme the students should be able to-

**PSO1**-Comprehend the behavioral patterns of different economic agents and acquire the competency to apply the fundamentals of Microeconomics and Macroeconomics in understanding the economic aspects of allied sectors.

**PSO2**-Evaluate the developmental parameters of an economy with the help of economic theories and examine the existing socio-economic issues of developing nations and formulate strategies to pave the way for further development.

**PSO3**- Analyse and review the historical developments in the economic thoughts propounded by different schools and make a comparative assessment with the contemporary issues in Economics.

**PSO4**-Identify key issues and formulate ideas to undertake research studies and apply quantitative techniques to address the unresolved issues in Economics and other relevant disciplines.

**PSO5**-Demonstrate the potential for a variety of challenging careers through innovation, critical thinking, problem solving and lifelong learning, thereby being competitive in the job market by acquiring skills in using statistical software for research, employability and entrepreneurship.

**PSO6**-Contribute to the academic advancement of the subject and society at large by pursuing advanced studies in Economics.

## 6. Teaching Learning Process:

The programme allows using varied pedagogical methods and techniques both within classroom and beyond.

- Lecture
- Tutorial
- Power point presentation
- Project Work/Dissertation
- Group Discussion and debate
- Seminars/workshops/conferences
- Field visits and Report/Excursions
- Mentor/Mentee

## 7. Assessment

- Home assignment
- Project Report
- Class Presentation: Oral/Poster/Power point
- Group Discussions
- In semester examinations
- End Semester examinations

## 8. Semester Duration

The semester duration for the Four-Year Undergraduate Programme (FYUGP) is organized into odd and even semesters.

- **Odd Semesters:** Odd semesters run from July to December with15 instructional weeks and 30 weekly hours of lectures, tutorials, and practical. They include

continuous evaluations, end-semester exams, breaks, and practical components like internships and community engagement.

- **Even Semesters:** Even semesters operate from January to June with 15 weeks of instruction and similar weekly hours. This period includes assessments, end- semester examinations and breaks to support learning.

# 9. Curriculum Components and Structure

The Four-Year Undergraduate Programme (FYUGP) features a structured course categorization designed to foster multidisciplinary learning and holistic development, as outlined in the National Education Policy (NEP) 2020. The curriculum includes Major (Core) courses, which form the foundation of the chosen discipline and Minor courses that complement the major by broadening knowledge in a secondary field. Multi-Disciplinary Courses (MDC) expose students to diverse domains. Skill Enhancement Courses (SEC) focus on practical, industry-relevant competencies. Additionally, Internships, Projects or Community Outreach provide hands-on experience, ensuring a balanced blend of theoretical and practical learning across the programme's 160 credits.

## 9.1    Curriculum Components

| S.N. | Components | Description |
|------|-----------|-------------|
| 1 | Major Discipline(Core) | The main subject of study in which a student will earn their degree. |
| 2 | Minor Discipline (2nd Major, if opted) | A secondary subject that complements the major, providing broader knowledge. |
| 3 | Multi-Disciplinary Generic Elective (MDC) | Three introductory-level courses from other disciplines to broaden intellectual exposure. |
| 4 | Skill Enhancement Courses (SEC) | Practical and soft skill straining for better employability. |
| 5 | Community Engagement | Real-world exposure through social service and outreach programs. |
| 6 | Field-Based Learning/Project | Practical learning through field visits and research-based activities. |
| 7 | Internship | Hands-on experience through industry exposure and training. |
| 8 | Research/Dissertation (For Honours with Research) | Advanced research work in a specific area for students opting for a research degree. |
| 9 | MOOCs (SWAYAM, Infosys Springboard, etc.) | Online certification courses that count for credit (up to 40% of total). |
| 10 | Value-Added Add-on Courses | Additional courses for skill enhancement that appear on the grade sheet but do not affect GPA. |

## 9.2 Curriculum Structure

| Sem. | Major (Core) | Minor | MDC | AEC | VAC | SEC | Others | Total Credit |
|---|---|---|---|---|---|---|---|---|
| I | CECO101(4) | MINECO101 (4) | MDCECO101 (3) | AEC101 (4) | VAC101 (2) | SEC101 (3) | -- | 20 |
| II | CECO202(4) | MINECO202 (4) | MDCECO202 (3) | AEC202 (4) | VAC202 (2) | SEC202 (3) | -- | 20 |
| III | CECO303, CECO304 (4x2) | MINECO303 (4) | MDCECO303 (3) | -- | VAC303 (2) | SEC303 (3) | -- | 20 |
| IV | CECO404, CECO405, CECO406 CECO407 (4x4) | MINECO404 (4) | -- | -- | -- | -- | -- | 20 |
| V | CECO505 CECO506 CECO507 (4x3) | MINECO505 (4) | -- | -- | -- | -- | IAPC500(4) | 20 |
| VI | CECO606 CECO607 CECO608 CECO609 (4x4) | MINECO606 (4) | -- | -- | -- | -- | -- | 20 |
| VII | CECO707 CECO708 CECO709 (4x3) | MINECO707 (4) | -- | -- | -- | -- | RM700(4) | 20 |
| VIII | CECO808 CECO909 (4x2) | MINECO808 (4) | -- | -- | -- | -- | 800 (Dissertation) / 2DSE (4+4) | 20 |
| Total | 80 | 32 | 9 | 8 | 6 | 9 | 16 | 160 |

**FYUGP in Economics (NEP)**

**Meeting Reference:**

This resolution was adopted in the 2<sup>nd</sup> Board of Studies meeting held on 21/06/2025 in online mode, chaired by Dr. Mamoni Sharma, Chairperson, BoS, Department of Economics, Digboi College (Autonomous)

**Expert Members:**

1. Prof. Amar Jyoti Mahanta, HoD, Department of Economics, Dibrugarh University

2. Prof. Nissar A Barua, Department of Economics, Gauhati University

3. Prof. Mrinal Kanti Dutta, Department of Humanities and Social Sciences, IIT, Guwahati

4. Dr. Gautom Purkayastha, Associate Prof., Margherita College

5. Mr. Rajarshi Gogoi, Proprietor, The Assam Computers, Tinsukia

**Preamble:**

In accordance with the academic requirements and the need for curriculum updating, the syllabus of FYUGP in Economics (NEP) was reviewed and revised by the syllabus committee constituted for the purpose. The revised syllabus has been designed to align with the [e.g., NEP 2020 guidelines / CBCS / industry standards], ensuring academic rigour and relevance.

**Resolution:**

After due deliberation and review, it is resolved that the revised syllabus for the course [FYUGP in Economics (NEP)], semester-wise (or paper-wise), is hereby approved. It is done after incorporating all the suggestions, modifications and advises given by the BoS experts in the first BoS meeting held on 26.06.25. The revised syllabus shall be implemented from the academic session [e.g., 2025–2026] onwards.

**Final Course Structure after modifications:**

| Year | Semester | Course (Lecture+ Tutorial+ Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
|---|---|---|---|---|---|---|---|
| | | Major(Core) | 1 | CECO101 | Introductory Microeconomics | 4 | - |
| **1** | **1st** | Minor | 1 | MINECO101 | Elementary Microeconomics | 4 | The course shall be taken by students from disciplines other than Economics |
| | | Multi- Disciplinary Generic Elective Course: Natural Science –I/ Social Science/Humanities-I/Commerce-I | 1 | MDCECO101 | Indian Economy: Evolution and its Contemporary State | 3 | The course shall be taken by students from disciplines other than Economics |
| | | AEC Language (MIL/Regional Language) | 1 | | | 4 | Students shall have to take one of the language disciplines offered by Digboi College |
| | | Value Added Course- | 1 | VAC1/ VAC2 | Understanding India/Health and Wellness | 2 | Students shall have to take any one of the courses of offered by Digboi College |
| | | Skill Enhancement Course | 1 | SEC 101 | Agriculture and Rural marketing | 3 | Students shall have to take the course offered by Digboi College |
| | | **Total** | 6 | | | **20** | |

| Year | Semester | Course (Lecture +Tutorial+ Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
|---|---|---|---|---|---|---|---|
| **1** | **2<sup>nd</sup>** | Major(Core) | 1 | CECO202 | Introductory Macroeconomics | 4 | - |
| | | Minor | 1 | MINECO202 | Elementary Macroeconomics | 4 | The course shall be taken by students from disciplines other than Economics |
| | | Multi-Disciplinary Generic Elective Course: Natural | 1 | MDCECO202 | Basic Development Economics | 3 | The course shall be taken by students from disciplines other than Economics |
| | | AEC: Language and Communication Skills (English)-II | 1 | | | 4 | Students shall have to take one of the language disciplines offered by Digboi College |
| | | Value Added Course- | 1 | VAC3/ VAC 4 | Environmental Education with emphasis on community- based activities/ Yoga | 2 | Students shall have to take any one of the courses offered by Digboi College |
| | | Skill Enhancement Course | 1 | | | 3 | Students shall have to take the course offered by Digboi College |
| | | **Total** | 6 | | | **20** | |
| | | **Grand Total (Semester I and II)** | | | | **40** | |

Students on exit shall be awarded Undergraduate Certificate (in the Field of Study/Discipline) after securing the requisite 40 Credits in Semesters I and II

| Year | Semester | Course (Lecture+ Tutorial+ Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
|---|---|---|---|---|---|---|---|
| 2 | 3rd | Major | 2 | CECO303 | Introductory Mathematical Methods for Economics | 4 | - |
| | | | | CECO304 | Indian Economy-Trends in Economic indicators | 4 | - |
| | | Minor | 1 | MINECO303 | Basics of Indian Economy | 4 | The course shall be taken by students from disciplines other than Economics |
| | | Multi-Disciplinary Generic Elective Course: Natural Science/Social Science/Humanities-III/Commerce-III | 1 | MDCECO303 | Operational Economics | 3 | The course shall be taken by students from disciplines other than economics |
| | | Value Added Course- | 1 | VAC5 / VAC6 | Digital and Technological Solutions/Digital Fluency | 2 | Students shall have to take the Course offered by Digboi College |
| | | Skill Enhancement Course | 1 | SEC303 | | 3 | Students shall have to take the Course offered by Digboi College |
| | | **Total** | 6 | | | **20** | |
| Year | Semester | Course (Lecture+ Tutorial+ Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
| 2 | 4th | Major | 4 | CECO405 | Essentials of Microeconomics | 4 | - |
| | | | | CECO406 | Economy of Assam | 4 | - |
| | | | | CECO407 | Statistical Methods for Economics | 4 | - |
| | | | | CECO408 | Intermediate Mathematical Methods for Economics | 4 | **-** |
| | | Minor | 1 | MINECO404 | Statistical Methods for Economics | 4 | The course shall be taken by students from disciplines other than Economics |
| | | **Total** | 5 | | | **20** | |
| | | **Grand total (Semester I, II, III and IV)** | | | | **80** | |

Students on exit shall be awarded Undergraduate Diploma (in the Field of Study/Discipline)after securing the requisite 80Credits in Semesters I, II, III and IV

| Year | Semester | Course (Lecture +Tutorial+ Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
|---|---|---|---|---|---|---|---|
| 3 | 5th | Major | 4 | CECOC509 | Intermediate Macroeconomics | 4 | |
| | | | | CECO510 | Basic Econometrics | 4 | |
| | | | | CECO511 | Development Economics I | 4 | |
| | | Minor | 1 | MINECO505 | Mathematical Methods in Economics | 4 | The course shall be taken by students from disciplines other than Economics |
| | | Internship/ Community Engagement/Project | 1 | | Internship(2)+Community Engagement (2) Or Internship(4)/(Community Engagement (4) | 4 | |
| | | **Total** | | | | **20** | |
| Year | Semester | Course(Lecture+ Tutorial+Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
| 3 | 6th | Major | 4 | CECO612 | Environmental Economics | 4 | |
| | | | | CECO613 | International Economics | 4 | |
| | | | | CECO614 | History of Economic Thought | 4 | |
| | | | | CECO615 | Public Finance | 4 | |
| | | Minor | 1 | MINECO606 | Public Finance | 4 | The course shall be taken by Students from disciplines other than Economics |
| | | Total | 5 | | | 20 | |
| | | **Grand Total (Semester I,II,III,IV,V and VI )** | | | | **120** | |
| Students on exit shall be awarded Undergraduate Degree (in the Field of Study/Discipline) after securing the requisite 120 Credits in Semesters I, II, III, IV, V and VI | | | | | | | |

| Year | Semester | Course(Lecture +Tutorial+ Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
|---|---|---|---|---|---|---|---|
| 4 | 7th | Major | 3 | CECOC716 | | 4 | |
| | | | | CECOC717 | | 4 | |
| | | | | CECOC718 | | 4 | |
| | | Minor | 1 | MINECO707 | | 4 | |

| Year | Semester | Course (Lecture+Tutorial+ Practical) | No. of Courses | Course Code | Name of the Course | Credit | Remarks |
|------|----------|------|------|------|------|------|------|
|  |  |  |  |  | Research Methodology | 4 |  |
|  |  | Total | 4 |  |  | 20 |  |
| 4 | 8th | Major | 2 | CECO819 |  | 4 |  |
|  |  |  |  | CECO820 |  | 4 |  |
|  |  |  |  |  | Dissertation/DSE 1 &DSE2 | 8/ 4+4 |  |
|  |  | Minor | 1 | MINECO808 |  | 4 |  |
|  |  | Total | 3 |  |  | 20 |  |
| Grand Total(Semester I, II, III, IV, V, VI, VII and VIII) | | | | | | 160 |  |
| Students be awarded Graduate with Honours Degree (in the Field of Study/Discipline) after securing the requisite 160 Credits in Semesters I, II, III, IV, V, VI, VII and VIII | | | | | | | |

## Signature of the experts: (Online Mode)

1. **Prof. Nissar A. Barua, Dept. of Economics, Gauhati University**

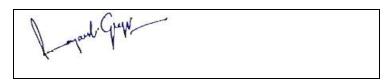2. **Prof. Mrinal Kanti Dutta, Dept. of Humanities and Social Sciences, IIT, Guwahati**

3. **Prof. Amarjyoti Mahanta, Dept. of Economics, Dibrugarh University**

4. **Dr. Gautam Purkayastha, Dept. of Economics, Margherita College**

5. **Mr. Rajarshi Gogoi, Proprietor, The Assam Computers, Tinsukia**

# DIGBOI COLLEGE (AUTONOMOUS)

# FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)

DETAILED SYLLABUS OF 1ST SEMESTER
Course Title Course Title: **Introductory Microeconomics**
Course Code: **CECO101**
Nature of Course: **Major**
Total Credits: **4 credits**
Distribution of Marks : **60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**    The objectives of this course are:

1. To introduce students to the core concepts and principles of microeconomic theory.
2. To help learners understand the key economic trade-offs and allocation challenges arising.

**Course Outcome:**    Upon completing this course, students will be able to:

**CO1:**    Develop an understanding of the foundational concepts of Microeconomics.
   LO1 .1    Describe the meaning and scope of Microeconomics.
   LO1.2    Explain how scarcity and the necessity of making choices are fundamental to economic reasoning

**CO2:**    Apply basic microeconomic principles to analyze the behavior of firms and households, focusing on the laws of demand and supply.
   LO 2.1    Elaborate on the law of demand, its determinants, and the factors influencing individual and market demand, including shifts in demand.
   LO 2.2    Illustrate the law of supply, its determinants, and analyze individual and market supply, along with factors causing supply shifts.

**CO3:**    Utilize microeconomic concepts to assess consumer behavior and determine consumer equilibrium.
   LO3.1    Explain the concept of a budget constraint and its role in consumer choice.
   LO3.2    Describe the properties and significance of indifference curves in consumer preference analysis.

**CO4:**    Apply microeconomic theories to understand production processes, producer's behaviour, producer's equilibrium.
   LO4.1    Explain production functions and isoquants
   LO4.2    Examine the marginal rate of technical substitution
   LO4.3    Analyze returns to scale in production
   LO4.4    Describe producer's equilibrium and producer's surplus.

**CO5:**    Apply microeconomic theories to understand cost and revenue.
   LO5.1    Introduce concept of costs and types of costs
   LO5.2    Explain short run and long run cost with diagrams
   LO5.3    Evaluate economies of scale and diseconomies of scale.
   LO5.4    Assess recent developments in cost theory.
   LO5.5    Analyse the concepts of revenue.

| UNITS | COURSE CONTENTS | L | T | P | Total Hours |
|---|---|---|---|---|---|
| I | **Basics of Microeconomics:**<br>Need of studying Microeconomics; Scope and method; Definition of Scarcity and choice; Types of Microeconomic Analysis, Goals of Microeconomics-Growth, Efficiency and Equity; The basic economic problems: what to produce, how to produce and how to distribute output; Economic models: Definition; Verification and general features of economic models ; Applications of microeconomics in different practical field | 9 | 3 | - | 12 |
| II | **Demand and Supply**<br><br>Definition of Market, Demand and Supply; market versus individual demand/supply; determinants of individual/ Market demand; Determinants of Individual/ Market supply; demand/supply schedule and demand/supply curve; Change and shift in the demand /supply curve; demand-supply equilibrium; how prices allocate resources; price elasticity and its application, methods of calculating price elasticity, concept of cross elasticity and income elasticity | 9 | 3 | - | 12 |
| III | Consumer's Behavior<br>The consumption decision – the cardinal utility theory- law of diminishing marginal utility, equilibrium of the consumer, consumer's surplus, the ordinal utility theory- indifference curve: definition and description of preference; properties of indifference curves, Marginal Rate of substitution; Budget line, consumer's equilibrium, income and substitution effect (concept only), Balancing Work, Leisure, and Consumption | 9 | 3 | - | 12 |
| IV | Producer's Behaviour<br>Production function, Iso-quants and its properties, Marginal Rate of Technical Substitution, Elasticity of Substitution, Expansion path, returns to scale; Production with One and with Two-Variable Inputs, producer's equilibrium- output maximisation and cost minimization, producer's supply | 9 | 3 | - | 12 |
| V | **Cost and revenue**<br>Definition and types of cost, cost function and its properties, cost in the short run and long run, short run and long run cost curves, traditional and modern theories of cost, economies and diseconomies of scale, production with two outputs- economies of scope, concept of revenue- total revenue, average revenue, marginal revenue | 9 | 3 | - | 12 |
| TOTAL | | 45 | 15 | - | 60 |

*Where,        L: Lectures      T: Tutorials     P:Practicals*

**MODES OF IN-SEMESTERASSESSMENT:**                                    **40 Marks**

- Two Internal Examinations    -                                       20 Marks

- Any two from the following:                                          20 marks
  Assignment/Group Discussion/Seminars/Project/
  Field Survey/departmental activities

## Cognitive map of Course outcomes with Bloom's Taxonomy

| Cognitive knowledge dimension | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Factual Knowledge | CO1 | CO1 | CO2,CO3 | | | |
| Conceptual Knowledge | CO1,CO5 | CO2,CO3, CO4,CO5 | CO2,CO3, CO4 | | CO5 | |
| Procedural Knowledge | | | CO3,CO4 | | CO5 | |
| Meta cognitive Knowledge | | | | | | |

## Mapping of Course Outcome with Program Outcome:

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |

*Suggested Readings:*

- Karl E. Case and Ray C. Fair, *Principles of Economics*, Pearson Education Inc., 8th Edition, 2007.
- N. Gregory Mankiw, *Economics: Principles and Applications*, India edition by South Western, a part of Cengage Learning, Cengage Learning India Private Limited, 4th Edition, 2007.
- Joseph E. Stiglitz and Carl E. Walsh, *Economics*, W.W. Norton & Company, Inc., New York, International Student Edition, 4th Edition, 2007.
- G. S. Maddala and Ellen Miller, *Microeconomics: Theory and Applications*, McGraw Hill Education, Tenth Reprint, 2013, New Delhi Edition.
- R. S. Pindyck, D. N. Rubinfeld, and P. L. Mehta, *Microeconomics*, 7th Edition, Pearson, New Delhi, 2009.
- Mc Connell, Brue, and Flynn, *Microeconomics: Principles, Problems, and Policies*, McGraw Hill Education (India) Private Limited, 2017.

# DIGBOI COLLEGE (AUTONOMOUS)
## FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)
DETAILED SYLLABUS OF 1ST SEMESTER
Course Title Course Title :**Elementary Microeconomics**
Course Code: **MINECO101**
Nature of Course: **Minor**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:** The objectives of this course are:

1.To help students understand the basic concepts in Economics.
2.To develop analytical, reasoning, and graphical presentation skills.
3.To enable students to appreciate the utility of economics in day-to-day life.

**Course Outcome:** Upon completing this course, students will be able to:

**CO1:** Comprehend the introductory principles of Microeconomics..
LO1 .1 Describe the meaning of Microeconomics.
LO1.2 Define the meaning of scarcity and opportunity cost.

**CO2:** Apply the basics of microeconomics in analyzing the behavior patterns of firms and households and relate them with the laws of demand and supply.
LO 2.1 Explain the law of demand, determinants of demand, shifts of demand versus movements along a demand curve, and market demand.
LO 2.2 Explain the law of supply, determinants of supply, shifts of supply versus movements along a supply curve, and market supply.
LO2.3 Explain the condition of market equilibrium.

**CO3:** Apply the fundamentals of microeconomics to understand the behavior of consumers and producers and the attainment of producer's and consumer's equilibrium.
LO3.1 Define the meaning of budget constraint.
LO3.2 Explain the meaning and properties of an indifference curve.
LO3.3 Explain the fundamentals of utility and its applications in consumer theory.
LO3.4 Explain the production function with one and two variables.
LO3.5 State the meaning and properties of an isoquant and equilibrium in production.

**CO4:** Apply the principles of microeconomics in relation to the production function, costs and revenues and demonstrate the basics of market mechanism and characteristics of different forms of markets
LO4.1 Explain the features of cost and revenue in the short run and long run respectively.
LO4.2 Discuss the features of different forms of markets.
LO4.3 Explain the equilibrium condition of firms under perfect competition.

**CO5:** To develop an understanding of the behavior of firms under different market structures and how prices and outputs are determined in each, with special emphasis on perfect competition, monopoly, monopolistic competition, and oligopoly.
LO5.1 Explain the basic objectives of business firms and distinguish between different types of firm behavior.
LO5.2 Identify and differentiate the characteristics of various market models—perfect competition, monopoly, monopolistic competition, and oligopoly.
LO5.3 Analyze the mechanisms of price and output determination under perfect competition in the short run and long run.
LO5.4 Compare and contrast the price-output outcomes under monopoly, monopolistic competition, and oligopoly with those under perfect competition.
LO5.5 Understand the conceptual differences between a firm and an industry in terms

of market functioning and decision-making.

| UNITS | COURSE CONTENTS | L | T | P | Total Hours |
|---|---|---|---|---|---|
| I | **Introduction to Microeconomics**<br>What is Microeconomics; Problem of scarcity and choice: scarcity, choice and opportunity cost; production possibility frontier; economic systems; Demand and supply: law of demand, determinants of demand, shifts of demand versus movements along a demand curve, market demand, law of supply, determinants of supply, shifts of supply versus movements along a supply curve, market supply, market equilibrium; Applications of demand and supply: price rationing, price floors, consumer surplus, producer surplus; idea of dead weight loss; Elasticity: price elasticity of demand; types of elasticity; different methods of calculating price elasticity; determinants of elasticity of demand, cross elasticity and income elasticity | 9 | 3 | - | 12 |
| II | **Consumer Theory: Demand Analysis and Consumer Behaviour**<br>Household choice in output markets; determinants of household demand; Budget constraint; indifference curve: definition, derivation, consumer choice, derivation of Demand curve from indifference curve and budget constraint; the basis of choice: utility, utility maximizing rule, diminishing marginal utility and downward sloping demand; income and substitution effects; household choice in input markets. | 9 | 3 | - | 12 |
| III | Theory of Production<br>Behaviour of profit maximizing firms, production process, production functions with one variable input and with two variable inputs; choice of technology, iso-quant and iso-cost lines, cost minimizing equilibrium condition. | 9 | 3 | - | 12 |
| IV | Theory of Costs<br>Economic costs; Costs in the short run, costs in the long run, revenue and profit maximizations, minimizing losses, short run industry supply curve, economies and diseconomies of scale, long run adjustments. | 9 | 3 | - | 12 |
| V | **Theory of firm: price and output determination**<br>The firm; objectives of business firms; market models: perfect competition, monopoly, monopolistic, oligopoly; price and output determination under perfect competition: short run and long run; firm vs. industry. | 9 | 3 | - | 12 |
| TOTAL | | 45 | 15 | - | 60 |

*Where,         L: Lectures         T: Tutorials         P:Practicals*

**MODES OF IN-SEMESTER ASSESSMENT:     40 Marks**
- Two Internal Examinations    -      **20 Marks**
- Others (Any two)              -      **20 Marks**
  - Home assignment
  - Viva voce
  - Seminar
  - Group discussion
  - Quiz

## Cognitive map of Course out comes with Bloom's Taxonomy

| Cognitive knowledge dimension | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Factual Knowledge | CO1 | CO1 | | | | |
| Conceptual Knowledge | CO1 | CO1,CO2 | CO2,CO3,CO4 | | | |
| Procedural Knowledge | | | CO2,CO3,CO4 | CO2,CO3,CO4 | | |
| Meta cognitive Knowledge | | | | | | |

## Mapping of Course Outcome with Program Outcome:

| PO/CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | |
| CO3 | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | |
| CO4 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | |

**Suggested Readings:**

- Karl E. Case and Ray C. Fair, *Principles of Economics*, Pearson Education Inc., 8th Edition, 2007.
- N. Gregory Mankiw, *Economics: Principles and Applications*, India edition by South Western (Cengage Learning), 4th Edition, 2007.
- Joseph E. Stiglitz and Carl E. Walsh, *Economics*, W.W. Norton & Company, Inc., New York, International Student Edition, 4th Edition, 2007.
- G. S. Maddala and Ellen Miller, *Microeconomics: Theory and Applications*, McGraw Hill Education, Tenth Reprint, 2013, New Delhi Edition.
- Mc Connell, Brue, and Flynn, *Microeconomics: Principles, Problems, and Policies*, McGraw Hill Education (India) Private Limited, 2017.

DETAILED SYLLABUS OF 1ST SEMESTER
Course Title Course Title**: Indian Economy: Evolution and**
**its Contemporary State**
Course Code: **MDCECO101**
Nature of Course: **Multidisciplinary Generic Elective**
Total Credits:**3 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:** The objectives of this course are:

1.To acquaint students with the structure of the Indian economy in the colonial era and various contemporary issues
2.To equip students with the ability to analyze the policies and economic performance of India during British rule and compare it with present era.

**Course Outcome:** Upon completing this course, students will be able to:

**CO1:** Assess and critically examine the economic structure and policies of pre-independence India, recognizing the factors that contributed to economic stagnation.

LO1.1 Describe the economic structure and policies of pre-independence India.

LO1.2 Discuss how socio-cultural attitudes and inheritance laws influenced India's economic development.

LO1.3 Analyze the drain theory and its effects on the Indian economy.

LO1.4 Analyse the economic ideas of M. K. Gandhi.

**CO2:** Investigate the agrarian system, agricultural markets, and institutions, green revolution etc. along with India's industrial development status, constraints and reforms.

LO 2.1 Explain the agrarian structure of India.

LO 2.2 Examine the impact of agricultural markets and institutions on commercialization of agriculture.

LO2.3 Assess the Green Revolution and goal of self reliance in India.

LO2.4 Discuss state of industrial development in India along with its constraints and reforms.

**CO3:** Analyze the state of service sector and foreign trade in India and their effects on the economy.

LO3.1 Outline the trend and composition of service sector in India and their role in the economy

LO3.2 Discuss the direction and composition of foreign trade in India

LO3.3 Examine the trend of BoP after the implementation of LPG policy

LO3.4 Analyze India's foreign trade policy

**CO4:** Assess , analyze and compare the various contemporary issues in Indian economy.

LO4.1 Explain the India's population policy and in light of demographic dividend.

LO4.2 Discuss the status and importance of human development in India.

LO4.3 Evaluate policies and activities like urbanization and smart city mission, digital India etc.

Analyze various aspects of agricultural price policy, subsidy and public distribution system

| UNITS | Course contents | L | T | P | Total Hours |
|---|---|---|---|---|---|
| I | **History of Indian Economy**<br>An Overview of economic structure and policies of pre-independence era, drain theory; economic ideas of M.K. Gandhi. National Income in British Period–trend and composition; Population–growth, age structure and sex composition; Poverty. | 12 | | | 12 |
| II | **Agricultural and Industry Sector of India**<br>Agrarian structure; agricultural markets and institutions; Green Revolution and Self-Reliance, Commercialization of agriculture; The state of industrial development in India, constraints to industrial development; Industrial Policy Reforms. | 10 | | | 10 |
| III | **Service Sector and Foreign Trade in India**<br>Trend and Composition of Service Sector in India; Role of Service Sector in Indian Economy; India's Foreign Trade: Direction and composition; Trends of BoP after LPG Policy; India's Foreign Trade Policy. | 11 | | | 11 |
| IV | **Contemporary Issues of Indian Economy**<br>India's population policy; Demographic Dividend; Human Development in India. Urbanization and Smart City Mission: Success and Challenges, Digital India, Agricultural Price policy and Subsidies; Public Distribution System | 12 | | | 12 |
| TOTAL | | 45 | - | - | 45 |

*Where,          L: Lectures          T: Tutorials          P:Practicals*


**MODES OF IN-SEMESTER ASSESSMENT:          40 Marks**

- Two Internal Examinations     -          **20 Marks**
- Others (Any two)               -          **20 Marks**
  - Home assignment
  - Viva voce
  - Seminar
  - Group discussion
  - Quiz

## Cognitive Mapping of COS with Bloom's Taxonomy:

| Cognitive Knowledge Dimensions | Remember | Understand | Apply | Analyze | Evaluate | Create |
|---|---|---|---|---|---|---|
| Factual Knowledge | CO1,CO2, CO3,CO4 | CO1,CO2, CO3,CO4 | | | | |
| Conceptual Knowledge | | CO1,CO2, CO3,CO4 | CO2, CO4 | CO3, CO4 | CO1,CO2, CO3,CO4 | |
| Procedural Knowledge | | | | | | |
| Meta cognitive Knowledge | | | | | | |

## Mapping of COs with POs

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Suggested Readings:

- Lakshmi Subramanian, *History of India 1707–1857*, Orient Blackswan, 2010, Chapter 4.
- Sumit Guha, 1991, *Mortality Decline in Early 20th Century India*, *Indian Economic and Social History Review (IESHR)*, pp. 371–374 and 385–387.
- Tirthankar Roy, *The Economic History of India 1857–1947*, Oxford University Press, 3rd edition, 2011.
- J. Krishnamurty, *Occupational Structure*, in Dharma Kumar (ed.), *The Cambridge Economic History of India, Vol. II* (referred to as CEHI), 2005, Chapter 6.
- Ira Klein, 1984, *When Rains Fail: Famine Relief and Mortality in British India*, *Indian Economic and Social History Review (IESHR)*, Vol. 21.
- Jean Drèze, *Famine Prevention in India*, in Drèze and Amartya Sen (eds.), *Political Economy of Hunger*, WIDER Studies in Development Economics, 1990, pp. 13–35.
- John Hurd, *Railways*, in CEHI, Chapter 8, pp. 737–761.
- Rajat Ray (ed.), *Entrepreneurship and Industry in India*, 1994.
- A. K. Bagchi, *Deindustrialization in India in the Nineteenth Century: Some Theoretical Implications*, *Journal of Development Studies*, 1976.
- M. D. Morris, *Emergence of an Industrial Labour Force in India*, Oxford University Press, 1965, Chapter 11, "Summary and Conclusions."
- K. N. Chaudhuri, *Foreign Trade and Balance of Payments*, CEHI, Chapter 10.
- B. R. Tomlinson, 1975, *India and the British Empire 1880–1935*, *Indian Economic and Social History Review (IESHR)*, Vol. XII.
- Dharma Kumar, *The Fiscal System*, CEHI, Chapter 12.
- Basudev Chatterjee, *Trade, Tariffs and Empire*, Oxford University Press, 1992, Epilogue.

**DIGBOI COLLEGE (AUTONOMOUS)**
**FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)**
DETAILED SYLLABUS OF 1ST SEMESTER
Course Title Course Title**: Agriculture and Rural marketing**
Course Code: **SEC 101**

Nature of Course: **Skill Enhancement Course**
Total Credits: **3 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**    The objectives of this course are:

1.To provide practical and value-based education that helps transfer classroom knowledge to real-life rural settings.
2.To contribute towards inclusive growth by addressing regional disparities and reducing income inequality.
3.To develop critical thinking abilities for designing effective strategies in agriculture and rural development.
4.To build students' analytical skills to identify problems, form hypotheses, assess outcomes, and draw logical conclusions.
5.To encourage continuous learning and the development of skills that support professional work and job creation.

| Unit | Contents | L | T | P |
|------|----------|---|---|---|
| 1 (20 Marks) | **Basics of Agriculture and Rural Marketing:** Definition, nature and scope, classification of rural markets, rural v/s urban markets. marketing environment, infrastructure facilities, rural credit institutions, rural retail outlets. | 09 | 01 | |
| 2 (20 Marks) | **Rural Consumer Behaviour and Market Research:** Understanding Rural Consumer Behaviour; Key factors influencing rural consumer behaviour: Social, Technological, Economic and Political factors; Characteristics of Rural Consumers: Age and life cycle stages, Occupation and income levels, Economic conditions, Lifestyle patterns, Personality traits and brand perception, Rise of Consumerism, Researching Rural Market: Sensitizing rural market. | 08 | 01 | 04 |
| 3 (20 Marks) | **Agricultural Marketing: Inputs and Outputs:** Different agricultural inputs-a brief overview, Marketing strategies for inputs. Indian agricultural produces marketing, challenges in marketing of agricultural produce and inputs, Strategies to promote marketing, Problems and Prospects of agriculture and rural marketing, strategies for rural marketing, Need for marketing finance and source of marketing finance | 08 | | 04 |

| 4 (20 Marks) | **Standardization and Grading, processing and packaging**: Inspection of quality control --- Consumer Protection Act 1986. Public Distribution System (PDS). Different aspects of processing and packaging. **Institutional Support to Agriculture and Rural Marketing –** The National Co-operative Development Corporation (NCDC), Food Corporation of India (FCI), State Agriculture Marketing Boards, Assam --- Future of Rural marketing in Assam, Recent policies for agriculture. | 10 | | 04 |
| --- | --- | --- | --- | --- |
| | | 35 | 02 | 12 |

Where L=Lecture         T=Tutorials         P= Practical

### MODES OF IN-SEMESTER ASSESSMENT: 40 Marks

- Two Internal Examinations      -      **20 Marks**
- Others(Any two)  -                      **20 Marks**
  - Home assignment
  - Viva voce
  - Seminar
  - Group discussion
  - Quiz

**Reference Books:**

1. Badi R V Badi N.V: Rural Marketing
2. Acharya SS Agarwal: Agriculture Marketing in India
3. Economy of Assam: P.K.Dhar
4. Rural Marketing: CSG Krishnamacharyulu
5. Agricultural Economics: R.K. Lekhi

**DIGBOI COLLEGE (AUTONOMOUS)**
**FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)**
DETAILED SYLLABUS OF 2$^{ND}$ SEMESTER
Course Title Course Title**: Introductory Macroeconomics**
Course Code: **CECO202**
Nature of Course: Major
Total Credits:4 **credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**     The objectives of this course are:

1.To help students understand the meaning of macroeconomics and how the overall production of an economy is computed.
2.To familiarize students with the concepts of aggregate demand and aggregate supply.
3.To introduce students to classical and Keynesian theories of employment and output determination.
4.To help students understand the meaning of money and other related concepts.

**Course Outcome:**     Upon completing this course, students will be able to:

**CO1:**   Distinguish between different macroeconomic schools of thought and understand the fundamental objectives and scope of macroeconomics, laying the foundation for advanced macroeconomic analysis.

LO1.1     Differentiate between microeconomics and macroeconomics and understand the evolution of macroeconomics as a distinct field.

LO1.2     Explain the nature and scope of macroeconomics and identify the key objectives of macroeconomic study.

LO1.3     Compare and contrast different schools of macroeconomic thought: Classical, Keynesian, and Monetarist.

LO1.4     Analyze the relationship between microeconomic thinking and macroeconomic models, and discuss the balance between short-term stabilization and long-term economic growth.

**CO2:**   Define national income and various accounting methods, and assess the limitations and significance of GDP as an indicator of economic health and social welfare.

LO 2.1     Understand the importance of measuring economic activity and the various approaches to national income accounting.

LO 2.2     Define and differentiate between GDP and GNP, and explain the concepts of stocks and flows.

LO2.3     Describe the circular flow of income in an economy and the methods of measuring GDP: Income Method, Expenditure Method, and Value Added Method.

LO2.4     Evaluate the limitations of GDP as a measure of economic activity, including its relationship with the underground economy and social welfare, and understand the significance of sustainable accounting.

**CO3:**   Analyze the components and determinants of aggregate demand and aggregate supply, and understand how these factors interact to influence overall economic activity.

LO3.1     Define aggregate demand and its components, and identify the determinants of consumption, government spending, firm investment, and net exports.

LO3.2     Explain the consumption function, including marginal propensity to consume

(MPC) and average propensity to consume (APC), and the determinants of saving, including marginal propensity to save (MPS) and average propensity to save (APS).

LO3.3 Analyze the investment function and the factors that influence investment demand.

LO3.4 Describe the concept of aggregate supply, its determinants, and the factors that can shift the aggregate supply curve

**CO4:** Critically evaluate the classical and Keynesian theories of output and employment determination, and apply these concepts to understand historical and contemporary economic fluctuations.

LO4.1 Understand the classical theory of output and employment determination and Say's Law of Markets.

LO4.2 Analyze the Great Depression of the 1930s and the failure of the classical school, leading to the Keynesian revolution.

LO4.3 Explain the Keynesian theory, including the equality between output and aggregate demand, the concept of the multiplier, and the determination of equilibrium income.

LO4.4 Discuss changes in equilibrium income and the factors that can lead to such changes.

**CO5:** Explain the functions and types of money, determinants of money supply and demand, and the determination of the equilibrium rate of interest.

LO5.1 Define money and its various functions, and describe the different types of money, including fiat money, fiduciary money, metallic money, and paper money.

LO5.2 Explain the supply of money and the role of the central bank, and understand the different measures of money as defined by the RBI.

LO5.3 Discuss the demand for money and the quantity theory of money, including the motives for holding money: transaction, precautionary, and speculative.

LO5.4 Analyze the determination of the equilibrium rate of interest using the Keynesian liquidity preference theory

| UNITS | CONTENTS | Total Hours |
|-------|----------|-------------|
| I | **Introduction**<br>Microeconomics vs Macroeconomics; Nature and scope of macroeconomics; Objectives of Macroeconomics – short term vs long run, economic growth vs stabilization | 10 |
| II | **National Income Accounting**<br>Measuring the value of economic activity and its importance; Meaning of GDP and GNP; Stocks and flows; Circular flow in an economy; Approaches of measuring GDP– Income method, expenditure method, and value added method; Real GDP vs Nominal GDP; GDP deflator; GDP and Social welfare; Sustainable accounting and its significance | 12 |
| III | **Introduction to Aggregate Demand and Aggregate Supply**<br>Concept of aggregate demand; Components and determinants of aggregate demand; Consumption function –MPC and APC; Saving – determinants of saving – MPS and APS; Investment – determinants of investment demand; investment function; Concept of Aggregate supply; determinants of aggregate supply; factors shifting aggregate supply | 10 |
| IV | **Determination of output and employment**<br>The classical theory of determination of output and employment; Say's law of markets; The Great Depression of 1930s – failure of classical school and the Keynesian revolution; the Keynesian theory – equality between output and aggregate demand, the concept of multiplier, equilibrium income, changes in equilibrium income | 14 |
| V | **Introduction to money and theory of interest**<br>Definition of money; Functions of money; Types of money –Supply of money – Meaning and the role of central bank (money through credit creation not to be included), Vertical money supply curve, Measures of Money (RBI definitions); Demand for money – Meaning; The quantity theory of Money; Motives of demand for money – Transaction, Precautionary and Speculative; Determination of the equilibrium rate of interest – Classical theory of interest and the Keynesian liquidity preference theory | 14 |
| | **Total** | **60** |

## MODES OF IN-SEMESTERASSESSMENT:                        **40 Marks**

- Two Internal Examinations    -                        20 Marks
- Assignment/Group Discussion/Seminars/Project etc. -        10 marks
- Field Survey and other departmental activities (Group)-        10 marks

## Cognitive Map of Course Outcomes with Bloom's Taxonomy:

| Cognitive knowledge dimension | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Factual Knowledge | | | | | | |
| Conceptual Knowledge | | CO1,CO2, CO3,CO4, CO5 | CO3,CO4, CO5 | CO3,CO4, CO5 | CO3,CO4 | |
| Procedural Knowledge | | CO2,CO3, CO4,CO5 | CO3,CO4, CO5 | CO3, CO4,CO5 | | |
| Meta cognitive Knowledge | | | | | | |

## Mapping of Cos with POs:

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | | ✓ | | | | ✓ | | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | |

*Suggested Readings:*

- Dornbusch, R.,Fischer, S.& Startz, R.(2018).*Macroeconomics* (12[th]ed.).McGraw Hill Education
- Froyen, R.T.(2014).*Macroeconomic Theories and Policies*(10[th]ed.).Pearson Education
- Mankiw, N.G.(2007). *Macroeconomics* (6[th]ed.).Worth Publishers
- Sikdar, S.(2006).*Principles of Macroeconomics*. Oxford University Press

**DIGBOI COLLEGE (AUTONOMOUS)**
**FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)**
DETAILED SYLLABUS OF 2$^{ND}$ SEMESTER
Course Title Course Title**: Elementary Macroeconomics**
Course Code: **MINECO202**

Nature of Course: Minor
Total Credits:4 **credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

| | |
|---|---|
| **Course Objectives:** | The objectives of this course are:<br><br>1.To help students know the meaning of macroeconomics and how the overall production of an economy is computed.<br>2.To familiarize students with concepts of aggregate demand and aggregate supply.<br>3.To introduce students to the classical and Keynesian theories of employment and output determination.<br>4.To help students understand the meanings of money and other concepts related to money. |
| **Course Outcome:** | Upon completing this course, students will be able to: |

**CO1:** Describe the distinction between microeconomics and macroeconomics, including the development and objectives of macroeconomic theory.

| | |
|---|---|
| LO1.1 | Explain the distinctions between microeconomics and macroeconomics. |
| LO1.2 | Trace the historical evolution of macroeconomics as a distinct discipline. |
| LO1.3 | Identify and describe the primary schools of macroeconomic thought, including Classical, Keynesian, and Monetarist perspectives. |
| LO1.4 | Discuss the objectives of macroeconomics in terms of short-term stabilization and long-term economic growth |

**CO2:** Gain a comprehensive understanding of how economic activity is measured and the significance of national income accounting.

| | |
|---|---|
| LO 2.1 | Define and differentiate between GDP and GNP, including the concepts of stocks and flows. |
| LO 2.2 | Illustrate the circular flow of income in an economy. |
| LO2.3 | Compare and contrast the Income, Expenditure, and Value-Added approaches to measuring GDP. |
| LO2.4 | Evaluate the limitations of GDP as a measure of economic activity and its relationship to social welfare. |

**CO3:** Define the concepts of aggregate demand (AD) and aggregate supply (AS), including the identification of factors responsible for the shifts of AD and AS.

| | |
|---|---|
| LO3.1 | Define aggregate demand and explain its components and determinants. |
| LO3.2 | Analyze the consumption function, including the concepts of Marginal Propensity to Consume (MPC) and Average Propensity to Consume (APC). |
| LO3.3 | Discuss the determinants of saving and investment, including the functions of Marginal Propensity to Save (MPS), Average Propensity to Save (APS), and investment demand. |
| LO3.4 | Explain the concept of aggregate supply and identify factors that cause shifts in the aggregate supply curve. |

**CO4:** Compare and contrast the classical and Keynesian theories of output and employment determination and their relevance to economic equilibrium.

LO4.1 Describe the Classical theory of output and employment determination and Say's Law of Markets.

LO4.2 Analyze the impact of the Great Depression on the classical school and the rise of Keynesian economics.

LO4.3 Explain the Keynesian theory of equilibrium between output and aggregate demand, including the concept of the multiplier.

LO4.4 Calculate equilibrium income and understand its implications for macroeconomic stability.

**CO5:** Elaborate the role of money in the economy, the various types and measures of money, and the causes and effects of inflation.

LO5.1 Define money and its functions, and differentiate between different types of money (fiat money, fiduciary money, metallic money, and paper money).

LO5.2 Identify and explain the various measures of money supply (M0, M1, M2, M3, M4).

LO5.3 Discuss the quantity theory of money and its implications for prices and inflation.

LO5.4 Analyze the causes and types of inflation, its social costs and benefits, and the relationship between nominal and real interest rates.

| UNITS | CONTENTS | L | T | P | Total Hours |
|-------|----------|---|---|---|-------------|
| I | **Introduction**<br>Microeconomics vs Macroeconomics; Evolution of Macroeconomics as a separate discipline; Nature and scope of macroeconomics; Schools of macroeconomic thought – the classical, the Keynesian and the monetarist; Objectives of Macroeconomics – short term vs long run, economic growth vs stabilization | 9 | 1 | | 10 |
| II | **National Income Accounting**<br>Measuring the value of economic activity and its importance; Meaning of GDP and GNP; Stocks and flows; Circular flow in an economy; Approaches to measuring GDP – Income method, expenditure method, and value added method; GDP deflator; Real GDP vs Nominal GDP; GDP and Social welfare; | 12 | | | |
| III | **Introduction to Aggregate Demand and Aggregate Supply**<br>Concept of aggregate demand; Components and determinants of aggregate demand –consumption, government spending, firms' consumption, and net exports; Consumption function – MPC and APC; Saving – determinants of saving – MPS and APS; Investment – determinants of investment demand; investment function; Concept of Aggregate supply; determinants of aggregate supply; factors shifting aggregate supply | 9 | 1 | | 10 |
| IV | **Determination of output and employment**<br>The classical theory of determination of output and employment; Say's law of markets; The Great Depression of 1930s – failure of classical school and the Keynesian revolution; the Keynesian theory – equality between output and aggregate demand, the concept of multiplier, equilibrium income | 12 | 2 | | 14 |
| V | **Introduction to money and inflation**<br>Definition of money; Functions of money; Types of money– Measures of Money – M0, M1, M2,M3, and M4; Money, prices and inflation; Inflation – meaning, types and causes; social costs of inflation | 12 | 2 | | 14 |
| | **Total** | 54 | 6 | | 60 |

*Where,      L: Lectures      T: Tutorials      P:Practicals*

**MODES OF IN-SEMESTER ASSESSMENT:     40 Marks**

- Two Internal Examinations    -      **20 Marks**
- Others (Any two)      -      **20 Marks**
    - Home assignment
    - Viva voce
    - Seminar
    - Group discussion
    - Quiz

## Cognitive Map of Course Outcomes with Bloom's Taxonomy:

| Cognitive knowledge dimension | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Factual Knowledge | CO1 | CO1 | | | | |
| Conceptual Knowledge | CO1,CO2, CO3 | CO2,CO3, CO4, CO5 | CO3, CO5 | CO3,CO4, CO5 | | |
| Procedural Knowledge | | CO3, CO4, CO5 | CO3, CO4 | CO3,CO4, CO5 | CO4,CO5 | |
| Meta cognitive Knowledge | | | | | | |

## Mapping of COs with POs:

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | |
| CO2 | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |

*Suggested Readings:*

- Dornbusch, R., Fischer, S., & Startz, R. (2018). *Macroeconomics* (12th ed.). McGraw Hill Education.
- Froyen, R. T. (2014). *Macroeconomic Theories and Policies* (10th ed.). Pearson Education.
- Mankiw, N. G. (2007). *Macroeconomics* (6th ed.). Worth Publishers.
- Sikdar, S. (2006). *Principles of Macroeconomics*. Oxford University Press.

Course Title Course Title**: Basic Development Economics**
Course Code:**MDCECO203**

Nature of Course: Multidisciplinary Generic Elective
Total Credits: **3 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**     The objectives of this course are:

This course aims to help students grasp essential concepts of growth and development, providing a foundation for understanding their complexities in the future.

**Course Outcome:**     Upon completing this course, students will be able to:

**CO1:**     Develop a comprehensive understanding of development and underdevelopment by analyzing various economic growth theories and strategies.

LO1.1     Differentiate between economic growth and development, and describe the concept of the development gap.

LO1.2     Recognize the main characteristics of underdevelopment and understand the structural transformation processes in developing economies.

LO1.3     Analyze and compare prominent economic growth theories, including Classical, Harrod-Domar, Lewis, Neo-Classical, and New Growth models.

LO1.4     Assess different growth strategies such as balanced growth, unbalanced growth, and the critical minimum effort thesis.

**CO2:**     Evaluate the key factors affecting development, explore various development measures, and understand the concepts and indicators of poverty and inequality.

LO 2.1     Examine the significance of agriculture, capital, technology, and institutions in the development process.

LO 2.2     Explain how population growth influences economic development.

LO2.3     Compare different development indicators, such as GNP per capita, PQLI, and HDI.

LO2.4     Assess various concepts and measures of poverty and inequality, analyzing their impact on development.

**CO3:**     Examine the concepts of capabilities and functioning, understand human development, and explore the relationship between the environment and development, with a focus on sustainable development and climate change.

LO3.1     Explain the concepts of capabilities and functioning and their significance in human development.

LO3.2     Evaluate the environmental challenges faced by both developing and developed countries and their implications for sustainable development.

LO3.3     Analyze the effects of environmental issues, including global warming and climate change, on agriculture and the economy.

LO3.4     Assess policy options to address environmental challenges in developing and developed countries, considering the Sustainable

Development Goals (SDGs).

**CO4:** Gain an understanding of the relationship between trade, globalization, and economic development, exploring    trade policies and the historical context of globalization.

    LO4.1    Describe the role of trade in promoting economic growth and its potential as a driver of development.

    LO4.2    Compare and contrast import substitution and export promotion as strategies of trade policy.

| UNITS | CONTENTS | L | T | P | Total Hours |
|---|---|---|---|---|---|
| I | **Basic  Issues of Development:** Growth vs Development; Development gap; Characteristics of a Developing Economy; Growth strategies: Balanced growth and Unbalanced growth | 11 | | | 11 |
| II | **Issues of Development**: I Factors in the development- Agriculture, Capital, Technology and Institution; Population growth and Economic Development; Measures of Development- GDP/GNP per capita, PQLI, HDI: Comparative Analysis; Poverty and inequality: Concepts and measures | 12 | | | 12 |
| III | **Sustainable Development** Capabilities and Functioning's; Human development; Environment- Development Linkage; Environmental Issues of the developing and the developed countries, Sustainable development; SDGs; Global Warming and Climate Change | 12 | | | 12 |
| IV | **Trade, Globalization and Development:** Trade and Economic Growth; Trade Policy: Import substitution vs Export Promotion; Terms of Trade: Globalization: Concept and Present scenerio; Issues and Challenges | 10 | | | 10 |
| TOTAL | | 45 | | | 45 |

**MODES OF IN-SEMESTER ASSESSMENT:**       **40 Marks**

- Two Internal Examinations    -    **20 Marks**
- Others(Any two)        -    **20 Marks**
    - Home assignment
    - Viva voce
    - Seminar
    - Group discussion
    - Quiz

## Cognitive Mapping of COs with blooms taxonomy

| Cognitive Knowledge Dimensions | Remember | Understand | Apply | Analyze | Evaluate | Create |
|---|---|---|---|---|---|---|
| Factual Knowledge | CO2 | CO2, | | | | |
| Conceptual Knowledge | CO2 | CO1,CO2,CO3,CO4 | CO2 | CO2,CO3,CO4 | CO1,CO2,CO3 | |
| Procedural Knowledge | | | | | | |
| Meta-Cognitive Knowledge | | | | | | |

## Mapping of Cos with Pos

| POs/COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |

*Suggested Readings:*

- Ray, Debraj (1998). *Development Economics*. Oxford University Press.
- Thirlwall, A.P**.** (2011). *Economic Development*. Palgrave Macmillan.
- Todaro, M.P. & Smith, S.C**.** (2022). *Economic Development*. Pearson Education.
- Banerjee, Abhijit, Roland Benabou & Dilip Mookerjee (eds.) (2006). *Understanding Poverty*. Oxford University  Press.
- Sen, Amartya (2000). *Development as Freedom*. Oxford University Press.
- Maddison, Angus (2007). *The World Economy: A Millennial Perspective*. Academic Foundation.

# DIGBOI COLLEGE (AUTONOMOUS)
## FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)
DETAILED SYLLABUS OF 3RD SEMESTER
Course Title Course Title**: Mathematical Methods for Economics I**
Course Code: **CECOC303**

Nature of Course: **Major**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:** The objectives of this course are:

The objective of this course is to diffuse the knowledge of basic mathematics that enables the students to apply mathematical tools in various theories of economics.

**Course Outcome:** Upon completing this course, students will be able to:

**CO1:** Explain the foundational concepts like sets, relations and functions, evaluate limits and continuity, and apply these concepts to solve numerical problems.

LO1.1 Describe different types of sets and perform set operations.

LO1.2 Explain and construct ordered pairs, Cartesian products, and relations.

LO1.3 Explain functions, their properties and types, and graph different types of functions

LO1.4 Evaluate limits and continuity of functions

**CO2:** Apply matrices and determinants in solving linear equations and performing static and dynamic input-output analysis.

LO 2.1 Perform elementary matrix operations, including addition and multiplication.

LO 2.2 Determine the rank of a matrix and calculate determinants.

LO2.3 Compute the inverse of a matrix.

LO2.4 Apply Cramer''s rule to solve systems of linear equations.

LO2.5 Conduct static and dynamic input-output analysis using matrices

**CO3:** Apply rules of differentiation to analyze economic functions, including demand, cost and revenue and interpret their economic significance

LO3.1 Apply differentiation rules to functions with one independent variable.

LO3.2 Use derivatives in economic applications such as elasticity of demand and cost/revenue functions.

LO3.3 Explain the relationship between average and marginal costs using derivatives.

LO3.4 Compute second and higher-order derivatives and apply them to economic problems

**CO4:** Use different techniques of integration to solve economic problems, including calculation of producer's and consumer's surplus

LO4.1 Understand and apply basic rules of integration.

LO4.2 Use various techniques of integration including substitution, integration by parts, and partial fraction decomposition.

LO4.3 Derive total functions from marginal functions through integration.

LO4.4 Evaluate definite integrals and apply them to compute producer's and consumer's surplus.

**CO5:** Understand and solve first order linear differential equations and concept of exact differential equations, with applications to economic problems.

      LO5.1    Identify and solve first order linear differential equations using standard methods and interpret their solutions in the context of economic problems.

| UNITS | CONTENTS | L | T | Marks in end sem exam |
|---|---|---|---|---|
| I | **Introduction to Basic Mathematical Problems**<br>Set: types and operations; Cardinality of Set Theory; Concept of Ordered pairs, Cartesian products and relations. Functions; Properties and graphs of functions- polynomial, rational, exponential, and logarithmic; Limit and Continuity of a function. | 10 | 1 | 12 |
| II | **Applications of Matrix and Determinant**<br>Matrices: Meaning, Types, elementary operations: addition, product, rank of a matrix, Determinants: meaning properties, inverse of a matrix, Application of Cramer's rule for solution of a system of linear equations; Input-output analysis | 10 | 3 | 12 |
| III | **Derivatives of Functions of One Independent Variable**<br>Rules of differentiation for a function with one independent variable; Economic application of derivatives; Elasticity of demand, Cost and Revenue functions; Relation between Average and Marginal Costs, Second and higher order derivatives and application in Economics. | 10 |  | 12 |
| IV | **Integration of functions**<br>Basic Rules of integration; Techniques of integration- substitution rule, integration by parts and partial fraction; Derivation of total functions from marginal functions; Definite integrals and its applications: Producer's surplus and consumer's surplus. | 10 | 5 | 12 |
| V | **Differential Equation**<br>First order linear differential equations; concept of exact differential equation, economic applications. | 5 | 4 | 12 |
| TOTAL |  | 45 | 15 | 60 |

**Where, L: Lectures    T: Tutorials    P:Practicals**

**MODES OF IN-SEMESTERASSESSMENT:**                    **40 Marks**

- Two Internal Examinations   -                    20 Marks
- Assignment/Group Discussion/Seminars/Project etc. -     10 marks
- Field Survey and other departmental activities (Group)-    10 marks

*Suggested Readings:*

- **K. Sydsaeter and P. Hammond,** *Mathematics for Economic Analysis*, Pearson Educational Asia: Delhi, 2002.
- **Chiang, A.C.,** *Fundamental Methods of Mathematical Economics*, Fourth Edition, McGraw Hill, 2005.
- **Hoy, M., J. Livernois, C. McKena, R. Rees, and T. Stengos,** *Mathematics for Economics*, PHI Publishers.
- **Barua, Srinath**, *Basic Mathematics and Its Applications in Economics*, Second Edition, Laxmi Publications, 2013.

Course Title Course Title**: Indian Economy-Trends in Economic Indicators**
**Course Code:** CECOC304
Nature of Course: **Major**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:** The objectives of this course are:

This course aims to examine major trends in India's economic indicators in the post-independence period using appropriate analytical frameworks, with a special focus on paradigm shifts and turning points. Emphasis is placed on capturing emerging economic issues.

**Course Outcome:** Upon completing this course, students will be able to:

**CO1:** Assess India's economic development trajectory since independence and analyze the transition in development strategies from import substitution to post-1991 globalization.

LO1.1 Identify the key characteristics of the Indian economy at the time of independence.

LO1.2 Compare and contrast the objectives and components of different development strategies adopted in India since independence.

LO1.3 Analyze the impact of import substitution and protectionist policies on India's economic progress.

LO1.4 Evaluate the effectiveness and challenges of the post-1991 globalization policies, including stabilization and structural adjustment programs.

**CO2:** Examine the relationship between population dynamics and human development indicators in India and assess the country's position in the global human development framework.

LO 2.1 Describe India's demographic trends, including population size, growth rates, and age-sex composition.

LO 2.2 Explain the concept of the demographic dividend and its implications for India's economic growth.

LO2.3 Assess the effectiveness of the National Population Policy in addressing demographic challenges.

LO2.4 Evaluate India's human development performance using indicators such as the Human Development Index and compare it with global standards.

**CO3:** Analyze the issues of poverty and income inequality in India and evaluate the policies and strategies aimed at poverty reduction and reducing income disparities.

LO3.1 Define and explain the concept of poverty and its prevalence in India.

LO3.2 Interpret poverty estimates and trends over time and analyze the relationship between economic growth and poverty alleviation.

LO3.3 Identify the causes of income inequality in India and assess its extent and characteristics.

LO3.4 Evaluate government policies and measures designed to reduce poverty and address income inequality in India.

**CO4:** Study the dynamics of India's labor force, occupational structures, and unemployment trends, and assess the role of government policies in tackling unemployment.

LO4.1    Describe the growth and structure of India's labor force and its relationship with economic development.

LO4.2    Analyze the different types and nature of unemployment in India.

LO4.3    Examine the changing patterns of employment and unemployment over time.

LO4.4    Assess the effectiveness of government policies in addressing unemployment challenges and promoting inclusive economic growth.

**CO5:** Analyze India's economic engagement with the global economy and conduct a comparative study of India's development experience with high-performing Asian economies.

LO5.1    Describe India's integration into the global economy and identify key factors driving its international economic relations.

LO5.2    Compare and contrast India's development strategies with those of high-performing Asian economies such as Singapore, South Korea, and Taiwan.

LO5.3    Analyze the factors contributing to the economic success of high-performing Asian economies and their relevance to India's growth strategy.

LO5.4    Evaluate the lessons drawn from international comparisons to guide India's future economic policies and strategies.

| UNITS | CONTENTS | L | T | P | Total Hours |
|---|---|---|---|---|---|
| I | **Indian Economy: Evolution and Contemporary Status** Indian Economy on the eve of independence- An overview; Alternative development strategies since independence- goal of self-reliance based on import substitution and protection, the post-1991globalization strategies based on stabilization and Structural adjustment packages.. | 10 | | | 10 |
| II | **Population and Human Development** Demographic features and trends- Size and growth rates of population, trends in birth and death rates, Density of population, Age and Sex Composition, Population as a factor of economic development, Demographic Dividend; National Population Policy; India's human Development record in global perspective. | 14 | | | 14 |
| III | **Poverty and inequality** Poverty- Concept and Incidence of Poverty in India, Poverty estimates, Growth and Poverty, Strategy of Poverty Alleviation; Inequality-Income inequality in India: Magnitude and Nature, Growth and Inequality, Causes of income inequality, Government policies and measures. | 10 | | | 10 |
| IV | **Labour force, occupational pattern and unemployment** Labour force growth, occupational distribution of labour force; Unemployment Nature and, volume of employment in India, Magnitude, Changing dimensions of unemployment and employment, Causes of unemployment, Government policies and measures. | 14 | | | 14 |
| V | **International Comparisons** India's economic interaction with the world economy, A comparative assessment of India's development experience with China, Pakistan and Japan. | 12 | | | 12 |
| TOTAL | | 60 | | | 60 |

## MODES OF IN-SEMESTER ASSESSMENT:                    **40 Marks**

- Two Internal Examinations    -                              20 Marks
- Assignment/Group Discussion/Seminars/Project etc. -         10 marks
- Field Survey and other departmental activities (Group)-     10 marks

## Cognitive Mapping of COs with blooms taxonomy

| Cognitive Knowledge Dimensions | Remember | Understand | Apply | Analyze | Evaluate | Create |
|---|---|---|---|---|---|---|
| Factual Knowledge | CO1,CO2, CO3,CO4, CO5 | CO2,CO3, CO4 | | CO2,CO3, CO4 | CO3,CO4 | |
| Conceptual Knowledge | CO2,CO3 | CO1,CO2 | CO3 | CO2,CO3, CO4 | CO1,CO2, CO5 | |
| Procedural Knowledge | | | CO3 | | | |
| Meta-Cognitive Knowledge | | | | | | |

## Mapping of COs with POs

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | |

**Suggested Readings:**

- Mishra, S.K. & V.K. Puri (2001), *Indian Economy – Its Development Experience*, Himalaya Publishing House.
- Dutt, Ruddar and K.P.M. Sundaram (2001), *Indian Economy*, S. Chand & Co. Ltd., New Delhi.
- Jalan, B. (1996), *India's Economic Policy – Preparing for the Twenty-First Century*, Viking, New Delhi.
- Joshi, Vijay and L.M.D. Little (1998), *India's Economic Reform 1991–2001*, Delhi.
- Shankar Acharya (2010), "Macroeconomic Performance and Policies," in Shankar Acharya and Rakesh Mohan (eds.), *India's Economy: Performance and Challenges: Development and Participation*, Oxford University Press.

**DIGBOI COLLEGE (AUTONOMOUS)**
**FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)**
DETAILED SYLLABUS OF 3RD SEMESTER
Course Title Course Title**: Basics of Indian Economy**
**Course Code: MINECO303**
Nature of Course: **Minor**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**      The objectives of this course are:

To enhance the knowledge of the students about the features of Indian economy in different phases of growth, trends in basic economic parameters and to discuss the fundamental problems being faced by the economy.

**Course Outcome:**      Upon completing this course, students will be able to:

**CO1:**    Comprehend and assess the evolution of development strategies in India since independence and in different phases of the history till date.

**CO2**    Evaluate the demographic characteristics and trends in India, including population growth, composition, and policy implications.

**CO3**    Examine the nature, incidence and strategies for alleviating poverty and income inequality in India.

**CO4**    Scrutinize the structure and dynamics of the labor force, occupational patterns, and unemployment in India.

**CO5**    Appraise human development indicators and India's performance in human development at both national and global levels.

| UNITS | CONTENTS | Marks in End Sem |
|-------|----------|------------------|
| I | **Development strategies in Different Phases of Growth** Indian Economy during Colonial Era; Development strategies since independence: Economic Planning, goal of self-reliance, import substitution and protection; LPG Policy: globalization strategies based on stabilization and structural adjustment packages. | 15 |
| II | **Demographic Structure: Population, Labour Force & Unemployment**-Size and growth rates of population, Density of population, Age and Sex Composition, Demographic Dividend; Magnitude and Growth of Labour force In India; Occupational Structure and economic development, occupational distribution of labour force; Unemployment-Nature and types of unemployment in India, Magnitude, Causes of unemployment, Government policies and measures. | 15 |
| III | **Fundamental Economic Problems** Poverty-Concept and Incidence of Poverty in India, Economic Growth and Poverty, Strategy of Poverty Alleviation; Inequality-Income inequality in India: Magnitude and Nature, Growth and Inequality, Causes of income inequality, Government policies and measures. | 15 |

| IV | **Agriculture Industry and Service Sector**<br>Role of Agriculture, Industry and Service Sector in Indian Economy;<br>Performance of Agriculture, Industry and Service Sector in the post economic reform period; Policies and Issues | 15 |
|---|---|---|
| TOTAL | | 60 |

**MODESOFIN-SEMESTERASSESSMENT:**     **40 Marks**

- Two Internal Examinations    -     **20 Marks**
- Others (Any two)     -     **20 Marks**
  - Home assignment
  - Viva voce
  - Seminar
  - Group discussion
  - Quiz

*Suggested Readings*

- **Mishra, S.K. & V.K. Puri** (2001). *Indian Economy and Its Development Experience*. Himalaya Publishing House.
- **Dutt, Ruddar and K.P.M. Sundaram** (2001). *Indian Economy*. S. Chand & Co. Ltd., New Delhi.
- **Jalan, Bimal** (1996). *India's Economic Policy – Preparing for the Twenty-First Century*. Viking, New Delhi.
- **Joshi, Vijay and I.M.D. Little** (1998). *India's Economic Reforms 1991–2001*. Oxford University Press, Delhi.
- **Acharya, Shankar** (2010). "Macroeconomic Performance and Policies," in Shankar Acharya and Rakesh Mohan (eds.), *India's Economy: Performance and Challenges – Development and Participation*. Oxford University Press.
- **Basu, Kaushik and A. Maertens** (eds.) (2013). *The New Oxford Companion to Economics in India*. Oxford University Press.
- **Jalan, Bimal** (ed.). *The Indian Economy: Problems and Prospects*. Penguin Books Ltd.
- **Subramanian, Arvind**. *India's Turn: Understanding the Economic Transformation*. Oxford University Press.
- **Kapila, Uma**. *Indian Economy: Policies and Performances*. Academic Foundation.

DETAILED SYLLABUS OF 3RD SEMESTER
Course Title Course Title**: Operational Economics**
**Course Code:** MDCECO303
Nature of Course: Multidisciplinary
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**    The objectives of this course are:

1.Introduce basic economic concepts used in business and operations.
2.Equip students with tools to understand economic decision-making.
3.Enable analysis of simple real-world problems involving cost, demand, pricing, and policy.
4.Promote multidisciplinary thinking using examples from business, public policy, and social sectors.

**Course Outcome:**    Upon completing this course, students will be able to:

**CO1:**    Introduce basic economic concepts used in business and operations.

LO1.1    To understand the concept, scope & importance of operational economics;

LO1.2    To explain basic economic problems: Scarcity, Choice, and Opportunity Cost

LO1.3    To understand Decision-Making in Households, Firms, and Governments

LO1.4    To explain the Concept of Efficiency and Optimal Use of Resources.

**CO2:**    Equip students with tools to understand economic decision-making

LO 2.1    To understand the ideas of Demand and Supply and the Basic Concepts and Curves; Price Mechanism and Market Equilibrium;

LO 2.2    To explain the concept and applications of Elasticity of Demand

LO2.3    To have simple understandings of the concepts of Costs and Revenues (Fixed, Variable, Total)

LO2.4    To learn the concept and functioning of share market and stock exchanges

**CO3:**    Enable analysis of simple real-world problems involving cost, demand, pricing, and policy.

LO3.1    To learn the types of Production: Goods and Services; Basic Input-Output Relationships

LO3.2    To understand the mechanism of Decision-Making by Firms and Cost Minimization

LO3.3    To learn the basic concepts of profit

LO3.4    To understand Market Types: Perfect Competition, Monopoly, Monopolistic, Oligopoly

**CO4:**    Promote multidisciplinary thinking using examples from business, public policy, and social sectors.

LO4.1    To learn Cost-Benefit Analysis in Daily Life and Projects;

LO4.2    To understand Break-even Analysis; Basics of Resource Allocation in Public Services (e.g., Hospitals, Water Supply)

LO4.3    To have the knowledge of Public Policy: Subsidies, Taxes, and Welfare Schemes;

LO4.4     To understand Sustainability and Efficiency in Indian Context

| UNITS | CONTENTS | Marks |
|---|---|---|
| I | **Foundations of Operational Economics**<br>Concept, Scope & Importance of Operational Economics; Basic Economic Problems: Scarcity, Choice, and Opportunity Cost; Decision-Making in Households, Firms, and Governments; Concept of Efficiency and Optimal Use of Resources. | 15 |
| II | **Demand, Supply and Markets**<br>Demand and Supply: Basic Concepts and Curves; Price Mechanism and Market Equilibrium; Elasticity of Demand; Simple Introduction to Costs and Revenues (Fixed, Variable, Total); Concept and functioning of share market and stock exchanges. | 15 |
| III | **Production, Firms and Decision-Making**<br>Types of Production: Goods and Services; Basic Input-Output Relationships (Simple production functions); Decision-Making by Firms: Cost Minimization, Basic Profit Concept; Introduction to Market Types: Perfect Competition, Monopoly, Monopolistic, Oligopoly (Basic Features) | 15 |
| IV | **Operational Choices in the Real World**<br>Cost-Benefit Analysis in Daily Life and Projects; Break-even Analysis; Basics of Resource Allocation in Public Services (e.g., Hospitals, Water Supply); Introduction to Public Policy: Subsidies, Taxes, and Welfare Schemes; Sustainability and Efficiency in Indian Context | 15 |
| | **Total** | 60 |

**MODES OF IN-SEMESTERASSESSMENT:**                              **40 Marks**

- Two Internal Examinations    -                              20 Marks

- Any two from the following:                              20 marks
  Assignment/Group Discussion/Seminars/Project/
  Field Survey/departmental activities

## Cognitive map of Course outcomes with Bloom's Taxonomy

| Cognitive knowledge dimension | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Factual Knowledge | CO1 | CO1 | CO2,CO3 | | | |
| Conceptual Knowledge | CO1,CO5 | CO2,CO3, CO4,CO5 | CO2,CO3, CO4 | | CO5 | |
| Procedural Knowledge | | | CO3,CO4 | | CO5 | |
| Meta cognitive Knowledge | | | | | | |

## Mapping of Course Outcome with Program Outcome:

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |

*Suggested Reading:*

1. "Economics" – Paul Samuelson (Simplified Chapters)
2. "Essentials of Economics" – N. Gregory Mankiw (Introductory Version)
3. NCERT Economics Textbooks (Class XI-XII, select chapters)
4. News articles, infographics, and caselets from The Hindu Business Line, EPW, India Spend

**FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)**
DETAILED SYLLABUS OF 4<sup>TH</sup> SEMESTER
Course Title Course Title**: Essentials of Microeconomics**
Course Code**: CECO405**
Nature of Course: **Major**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**     The objectives of this course are:

1. to develop an understanding of consumer and producer behavior using microeconomic principles.
2. to enable students to analyze firm behavior under different market structures.
3. to apply microeconomic models to evaluate the implications of public policies such as taxation and subsidies.

**Course Outcome:**     Upon completing this course, students will be able to:

**CO1:**     Analyze consumer's theory
LO1.1     Explain utility functions, direct and indirect utility function.
LO1.2     Describe income and substitution effects of price changes.
LO1.3     Apply Slutsky's equation in consumer choice analysis.
LO1.4     Differentiate between compensated and ordinary demand curves.
LO1.5     Examine consumer behavior under risk
LO1.6     Analyse revealed preference theory.

**CO2:**     Apply the perfect competition model to assess the welfare effects of public policies.
LO 2.1     Analyze profit maximization in competitive markets.
LO 2.2     Evaluate short-run and long-run equilibrium.
LO2.3     Analyse optimal resource allocation
LO2.4     Derive long run market supply curve
LO2.5     Apply market models to study taxation

**CO3:**     Evaluate firm behavior under monopoly and monopolistic competition
LO3.1     Examine monopoly pricing strategies.
LO3.2     Examine forces of monopoly power and social cost of monopoly
LO3.3     Examine pricing under monopolistic completion
LO3.4     Assess the impact of monopolistic competition

**CO4:**     Evaluate firm behaviour under collusive and non-collusive oligopoly
LO4.1     Analyse features of oligopoly market
LO4.2     Compare oligopoly models and strategic interactions.
LO4.3     Study collusive behaviors, including cartels and price leadership.

**CO5:**     Examine the characteristics and functions of input markets
LO5.1     Analyse firm behaviour in the short run and long run using one and two variable factors in labour markets
LO5.2     Explain the concepts of rent and profit maximisation within the input market
LO5.3     Understand the key principles governing the capital market.

| Units | | L | T | P | Total Hours |
|---|---|---|---|---|---|
| 1 | **Theory of Consumer Behaviour** <br> Utility Functions- Direct and Indirect Utility Function, Price effect- income and substitution effects of price change for normal, inferior and giffen goods ; Decomposition of Price Effect into Income and Substitution Effects under Hicksian and Slutsky's methods, Compensated and ordinary demand curve; choice under risk, Revealed preference theory. | 9 | 3 | - | 12 |
| 2 | **Perfect Competition** <br> Profit maximization by a price taking firm; Economic vs accounting profit; Short run and long run equilibrium under perfect competition; Long-run market supply curve; Practical applicability of the concept of competitive market- invisible hand, Excise duty and subsidies | 9 | 3 | - | 12 |
| 3 | **Monopoly and monopolistic competition** <br> Definition and features of monopoly market, Equilibrium price-output decision in Monopoly Market; Sources of Monopoly Power, Social Costs of Monopoly Power, Price discrimination of first, second and third degree, price-output determination under price discrimination, peak-load pricing, two part tariff, Monopolistic competition-characteristics, output decision-short run and long run, excess capacity | 9 | 3 | - | 12 |
| 4 | **Oligopoly** <br> Features of a Oligopoly Market-pricing and output decision; Various Models of Oligopoly: Non Collusive models-Cournot, Bertrand and Kinked demand model; Collusive Oligopoly model: Cartels and Price leadership | 9 | 3 | - | 12 |
| 5 | **Input Markets** <br> *Input Demand: Land and Labour Markets* <br> Basic concepts of input markets; Labour market: Firm's input decisions using one or two variable factors in the short and long run; Land market: Rent determination, relationship between rent and output, profit maximization in input markets; Input demand curves: Factors causing shifts in input demand; Resource allocation, output mix, and income distribution in competitive markets <br> *Input Demand: Capital Market and Investment Decision* <br> Concept and types of capital; Investment, depreciation, and capital accumulation; Capital market and financial market operations; Capital income: Interest and profits; Factors influencing investment decisions and demand for new capital | 9 | 3 | - | 12 |
| Total | | 45 | 15 | | 60 |

*Where ,L:Lectures      T: Tutorials     P: Practicals*

**MODES OF IN-SEMESTERASSESSMENT:**                              **40 Marks**

- Two Internal Examinations    -                                          20 Marks

- Any two from the following:                                          20 marks
  Assignment/Group Discussion/Seminars/Project/ Field Survey/departmental activities

### Cognitive mapping of Cos with blooms taxonomy

| Cognitive Knowledge Dimensions | Remember | Understand | Apply | Analyze | Evaluate | Create |
|---|---|---|---|---|---|---|
| **Factual Knowledge** | CO1,CO2, CO3 | CO1,CO2, CO3 | | | | |
| **Conceptual Knowledge** | | CO1,CO2, CO3 | CO1, CO2, CO3 | CO2, CO3 | CO1, CO2, CO3 | |
| **Procedural Knowledge** | | | CO1 | CO3 | CO3 | |
| **Meta cognitive Knowledge** | | | | | | |

### Mapping of Course Outcome with Program Outcome:

| PO/CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO2 | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO3 | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Suggested Readings –

- **Case, Karl E. & Fair, Ray C.** (2007). *Principles of Economics* (8th Edition). Pearson Education Inc.
- **Mankiw, N. Gregory** (2007). *Economics: Principles and Applications* (4th Edition, India Edition). Cengage Learning India Pvt. Ltd.
- **Stiglitz, Joseph E. & Walsh, Carl E.** (2007). *Economics* (4th Edition, International Student Edition). W.W. Norton & Company, New York.
- **Maddala, G.S. & Miller, Ellen** (2013). *Microeconomics: Theory and Applications* (10th Reprint). McGraw Hill Education, New Delhi.
- **Pindyck, R.S., Rubinfeld, D.N. & Mehta, P.L.** (2009). *Microeconomics* (7th Edition). Pearson, New Delhi.

- **Mc Connell, Brue & Flynn** (2017). *Microeconomics: Principles, Problems, and Policies*. McGraw Hill Education (India) Pvt. Ltd.
- A Koutsoyiannis, Modern Microeconomics, 2nd Edition, Mac Millan Education, UK, 1979

Course Title Course Title**: Economy of Assam**
Course Code**: CECO406**
Nature of Course: **Major**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**     The objectives of this course are:

1.To acquaint the learners with the economic characteristics as well as with the current issues of the economy of Assam.
2.To impart knowledge about the status of Assam in agriculture, industry, infrastructure and fiscal issues**.**

**Course Outcome:**     Upon completing this course, students will be able to:

**CO1:**     Critically appraise the performance of the Assam economy in terms of growth of State GDP

LO1.1     Identify and explain state GDP

LO1.2     Understand and analyze the trends in GDP and per capita income in Assam.

LO1.3     Assess the reasons for Assam's low state GDP and suggestion

LO1.4     Examine state's key natural resources and their utilisaion

LO1.5     Examine state's human resources and composition of population of Assam

LO1.6     Evaluate the occupational distribution of the state

**CO2:**     Analyse the role of agricultural sector in addressing food security and employment in Assam and evaluate the impact of various policies on agricultural intensification and modernization.

LO 2.1     Comprehend the role and performance of agriculture in Assam's economy.

LO 2.2     Analyze the land-use and cropping patterns in Assam.

LO2.3     Evaluate the trends in area and production of various crops, including food crops, horticulture  and plantation crops.

LO2.4     Understand the challenges and opportunities in agricultural marketing, finance, pricing and sustainable agricultural practices in Assam.

**CO3:**     Examine the performance of the industrial sector in Assam, including its structure, major industries, policies, financial sources, and the challenges and prospects faced by the industry.

LO3.1     Grasp the role and performance of the industrial sector in Assam.

LO3.2     Identify and discuss the industrial structure, including major industries, MSMEs, and cottage industries.

LO3.3     Evaluate the policies and programmes aimed at industrial development in Assam.

LO3.4     Assess the sources of industrial finance and the problems and prospects of the industrial sector in Assam.

**CO4:**     Assess the state of infrastructure in Assam, covering transport, communication, education, health, power and irrigation, along with the policies and programmes

aimed at infrastructural development.

LO4.1    Gain a comprehensive understanding about the significance of transport and communication infrastructure in Assam.

LO4.2    Evaluate the status and challenges in the education and health infrastructure in Assam.

LO4.3    Analyze the power and irrigation infrastructure and their impact on Assam's economy.

LO4.4    Discuss the policies and programmes designed to enhance infrastructural development in Assam.

**CO5:**    Describe the fiscal landscape of Assam, the sources of finance, the sharing of central taxes and grants and the expenditure patterns of the state.

LO5.1    Identify and explain the revenue and non-revenue sources of finance in Assam.

LO5.2    Comprehend the mechanisms of sharing central taxes and grants-in-aid.

LO5.3    Analyze the expenditure patterns of the Assam government.

LO5.4    Evaluate the fiscal policies and their impact on the economic development of Assam.

LO5.5    Evaluate the role of Central and State Finance Commission

| Unit | Contents | L | T | P | Total Hours |
|------|----------|---|---|---|-------------|
| I | **State GDP and State Resources** <br> Trend of state income after economic reforms, per-capita state GDP, Comparative analysis state GDP with the national level, reasons for low state income and suggestions for its improvement <br> State natural resources-land, water, mineral, forest; Human resources-trend in population growth, composition of population, occupational distribution | 12 | | | 12 |
| II | **Agriculture** <br> Role and performance of agriculture; Land- use Pattern in Assam, cropping pattern -Trend in Area and Production of food crops, Hortcultural/Plantation Crop, Vegetables-Fruits-Floriculture-Sericulture; Live stock Economy; Agricultural Marketing-Agricultural Finance-Agriculture Prices; modernization and sustainable agriculture, problems of agriculture. | 12 | | | 12 |
| III | **Industry** <br> Role and performance of Industry sector; Industrial Structure-Major, MSMEs and cottage industries; major industries of Assam; policies and programmes; Sources of Industrial Finance; problems and prospects of Industry sector; Problems and prospect of tourism industry of Assam | 12 | | | 12 |
| IV | **Infrastructure** <br> Power and irrigation; Transport and Communication, Education, Health, Policies and programmes for Infrastructural Development, Role of North Eastern Council | 12 | | | 12 |
| V | **Fiscal Issues**: Sources of State Finance-Revenue and non-Revenue sources; Sharing of Central Taxes and Grants-in-Aid; Expenditure Pattern, Central and State Finance Commission | 12 | | | 12 |
| | **Total** | 60 | | | 60 |

*Where, L:Lectures    T: Tutorials    P: Practical*


**MODES OF IN-SEMESTERASSESSMENT:**                    **40 Marks**

- Two Internal Examinations    -                    20 Marks
- Assignment/Group Discussion/Seminars/Project etc. -    10 marks
- Field Survey and other departmental activities (Group)-    10 marks

## Cognitive Map of Course Outcomes with Bloom's Taxonomy:

| Cognitive knowledge dimension | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Factual Knowledge | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Conceptual Knowledge | ✓ | ✓ | | ✓ | ✓ | |
| Procedural Knowledge | | | | ✓ | ✓ | |
| Meta cognitive Knowledge | | | ✓ | ✓ | ✓ | ✓ |

## Mapping of Cos with POs:

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | | ✓ | | | | ✓ | | ✓ | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| **CO4** | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **CO5** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |

*Suggested Readings*

- Directorate of Economics & Statistics. *Economic Survey,* various issues.
- Medhi,S.B., *Transport System and Economic Development of Assam*. Publication Board, Assam
- Nayak, P. *Growth and Human Development in North east India,* OUP India, 2010
- Dhar, P.K. Indian Economy, Kalyani Publication, 2021.
- Goswami J. and Verma A.S. , *Macro View on Assam Economy* , Bluerose Publishers Pvt. Ltd., 2023
- Buragohain, L and Changmai, T., Asomer Samajik Aaru Arthnetik Itihaas : Social & Economic History of Assam, Mahaveer Publications, 2022

**DIGBOI COLLEGE (AUTONOMOUS)**
**FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)**
DETAILED SYLLABUS OF 4TH SEMESTER
Course Title Course Title**: Statistical Methods for Economics**
Course Code**: CECO407**
Nature of Course: **Major**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**    The objectives of this course are:

This course aims to enable the students to apply basic statistical concepts, including measures of central tendency and measures of dispersion in real life situations and to acquaint the learners with the understanding and application of probability theory, sampling, correlation, index number in real world situations.

**Course Outcome:**    Upon completing this course, students will be able to:

**CO1:**    Apply the fundamental concepts of descriptive statistics to summarize and describe the essential features of data.

LO1.1    Define and calculate measures of central tendency (mean, median, mode) and explain their significance.

LO1.2    Describe and compute measures of dispersion (range, quartile deviation, mean deviation, standard deviation).

LO1.3    Explain the concept of skewness and kurtosis to understand data distribution.

**CO2:**    Apply probability theory and distribution models to solve problems involving uncertainty and variability.

LO 2.1    Explain basic probability concepts

LO 2.2    Analyze and apply conditional probability

LO2.3    Define and calculate mathematical expectation

LO2.4    Understand and apply theoretical distributions (Binomial

**CO3:**    Conduct sampling and hypothesis testing to draw inferences about populations from sample data.

LO3.1    Differentiate between sampling and census methods and describe various sampling techniques.

LO3.2    Identify and distinguish between sampling and non-sampling errors in statistics.

LO3.3    Define statistical hypotheses, understand the distributions of test statistics, and differentiate between Type I and Type II errors.

LO3.4    Conduct and interpret hypothesis tests using chi-square, t-test, and F-test.

**CO4:**    Analyze relationships between variables using correlation and regression techniques.

LO4.1    Explain and calculate covariance and interpret scatter diagrams.

LO4.2    Compute and interpret Spearman's rank correlation and Karl Pearson's coefficient of correlation.

LO4.3    Understand the concept of regression, derive regression lines, and use the method of least square

**CO5:**    Construct and interpret various types of index numbers for economic and business

analysis.

LO5.1    Explain the types and uses of index numbers.

LO5.2    Construct index numbers using the simple aggregate method and the weighted aggregate method (Laspeyres, Paasche, Fisher's price index).

LO5.3    Compute simple and weighted averages of price relatives and discuss the problems involved in constructing index numbers.

LO5.4    Analyze the applications of index numbers in economic and business contexts.

LO5.5    To understand and solve problems related to Deflating, Splicing and Base-Shifting

| Unit | Content | L | T | Total | Marks |
|------|---------|---|---|-------|-------|
| I | **Measures of Central Tendency and Dispersion** <br> Measures of Central Tendency and their application: Arithmetic Mean, Geometric Mean, Harmonic Mean, Median and Mode, Measures of Dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation, Concept of Skewness and Kurtosis. | 7 | 1 | 8 | 12 |
| II | **Probability Theory and Probability Distributions:** Probability: Basic Concepts, Classical and empirical definitions, Addition and Multiplication Theorems; Conditional Probability and Independence of Events; Mathematical Expectation, Theoretical Distributions: Binomial and Poisson distribution-Poisson distribution as a limiting case of binomial distribution, Normal distribution | 15 | 2 | 17 | 12 |
| III | **Sampling and Testing of Hypothesis:** <br> Sampling vs census**,** Methods of sampling, Errors in statistics: sampling vs. non-sampling errors, Testing of hypotheses: defining statistical hypotheses; distributions of Test statistics; Type I and Type II errors; Testing of hypothesis: chi square, *t* test, F test | 8 | 2 | 10 | 12 |
| IV | **Correlation and Regression Analysis:** <br> Elementary analysis of linear correlation: Scatter Diagram, Spearman's rank correlation, Karl Pearson's coefficient of correlation–Properties and the Method of Calculation, The Concept of Regression, Correlation vs Regression; Regression Lines, the method Least Squares | 15 | 2 | 17 | 12 |
| V | **Index Numbers** <br> Types and uses; methods of constructing index numbers: simple aggregate method, weighted aggregate method – Laspeyres, Paasche and Fisher's price index; Deflating, Splicing and Base-Shifting; problems in construction of index numbers. | 7 | 1 | 8 | 12 |
| | **Total** | **52** | 8 | 60 | 60 |

**MODES OF IN-SEMESTER ASSESSMENT:**                    **40 Marks**

- Two Internal Examinations    -                              20 Marks
- Assignment/Group Discussion/Seminars/Project etc. -      10 marks
- Field Survey and other departmental activities (Group)-   10 marks

### Cognitive Mapping of COs with Bloom's Taxonomy:

| Cognitive Knowledge Dimensions | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** |
| **Factual Knowledge** | | | | | | |
| **Conceptual Knowledge** | CO1,CO2, CO3, CO4 | CO1,CO2, CO3,CO4, CO5 | CO1,CO2, CO3,CO4, | CO2 | CO3 | |
| **Procedural Knowledge** | CO1,CO2 | CO1,CO2, CO3 | CO1,CO2, CO3,CO5 | CO2,CO3, CO4,CO5 | CO3,CO4, CO5 | CO5 |
| **Meta cognitive Knowledge** | | | | | | |

### Mapping of COs with POs:

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| **CO4** | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| **CO5** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |

*Suggested Readings*

- Jay L. Devor. *Probability and Statistics for Engineers*. Cengage Learning, 2010.
- John E.Freund. *Mathematical Statistics*. Prentice Hall,1992.
- RichardJ.LarsenandMorrisL.Marx.*AnIntroductiontoMathematicalStatisticsand its Applications.* Prentice Hall, 2011.
- William G. Cochra. *Sampling Techniques* .John Wiley, 2007.
- Gupta, S.C. *Fundamentals of Statistics*, Himalaya Publishing House
- Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons

**DIGBOI COLLEGE (AUTONOMOUS)**
**FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)**
DETAILED SYLLABUS OF 4$^{TH}$ SEMESTER
Course Title Course Title**: Intermediate Mathematical Methods**
**for Economics**
Course Code**: CECO408**
Nature of Course: **Major**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

<u>**Course Objectives:**</u>    The objectives of this course are:

1.Introduce the fundamental concepts of difference equations and their applications in economics.
2. Expand learners' understanding of derivatives by exploring functions of multiple variables and their practical uses.
3. Develop a strong grasp of various optimization techniques and their applications in different economic contexts.

<u>**Course Outcome:**</u>    Upon completing this course, students will be able to:

**CO1:**    Utilize first-order difference equations to model and analyze economic phenomena.
 LO1.1    Identify and solve first-order difference equations.
 LO1.2    Explain the solutions of difference equations in economic contexts.
 LO1.3    Use difference equations to model economic dynamics, including inventory control and market equilibrium.
 LO1.4    Evaluate the stability of economic models through difference equations.

**CO2:**    Apply partial and total differentiation techniques to solve economic problems related to production and consumer theory.
 LO 2.1    Compute partial and total derivatives of multivariable functions.
 LO 2.2    Utilize differentiation methods to analyze indifference curves and derive expansion paths.
 LO2.3    Assess production functions, particularly homogeneous functions, using Euler's Theorem.
 LO2.4    Compare the characteristics of Cobb-Douglas and CES production functions.

**CO3:**    Implement methods of unconstrained optimization to address economic problems involving single and multiple variables.
 LO3.1    Conduct unconstrained optimization for single-variable functions and interpret its economic significance.
 LO3.2    Solve optimization problems involving multiple variables.
 LO3.3    Apply optimization techniques to analyze economic scenarios such as discriminating and multiproduct monopolies.
 LO3.4    Interpret optimization results within the framework of economic decision-making.

**CO4:**    Employ Lagrange multipliers to solve constrained optimization problems, particularly in consumer and producer equilibrium analysis.
 LO4.1    Describe constrained optimization and the function of Lagrange multipliers.

| | | LO4.2 | Use Lagrange multipliers to solve optimization problems with equality constraints. |

LO4.2 Use Lagrange multipliers to solve optimization problems with equality constraints.

LO4.3 Examine consumer equilibrium through constrained optimization methods.

LO4.4 Determine producer equilibrium using constrained optimization and analyze the results

| Units | | L | T | P | Total Hours |
|---|---|---|---|---|---|
| **I** | **Difference equation:** <br> First order Difference equation and its Economic Applications. | 7 | 1 | | 8 |
| **II** | **Derivatives of Functions of several variables:** <br> Partial and Total differentiation and economic applications, Indifference curve analysis; Expansion Path, Production Function Analysis- Homogeneous Functions and Euler"s Theorem; Cobb- Douglas Production Function and its Properties; CES Production Function and its properties. | 16 | 3 | | 19 |
| **III** | **Unconstrained optimization:** <br> Unconstrained optimization with one variable and Economic Applications; Unconstrained optimization with more than one variable and Economic Applications- Discriminating Monopoly, multiproduct monopoly. | 16 | 3 | | 19 |
| **IV** | **Constrained optimization with equality constraints:** <br> Lagrange characterization using calculus; applications- consumer's equilibrium and producer's equilibrium. | 12 | 2 | | 14 |
| **Total** | | 51 | 9 | | 60 |

*Where  L: Lectures    T: Tutorials    P: Practical*

**MODES OF IN-SEMESTER ASSESSMENT:** **40 Marks**

- Two Internal Examinations    -                                    20 Marks
- Assignment/Group Discussion/Seminars/Project etc. -          10 marks
- Field Survey and other departmental activities (Group)-      10 marks

## Cognitive Mapping of COs with Bloom's Taxonomy:

| Cognitive Knowledge Dimensions | Cognitive Process Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** |
| **Factual Knowledge** | CO1 | | | | | |
| **Conceptual Knowledge** | CO1 | CO1,CO2,CO3, CO4, CO5 | CO1, CO2, CO3,CO4, CO5 | CO1,CO2, CO4 | | |
| **Procedural Knowledge** | | CO1,CO2,CO3, CO4, CO5 | CO1, CO2, CO3,CO4, CO5 | CO3,CO5 | | CO5 |
| **Meta cognitive Knowledge** | | | | | CO4 | |

## Mapping of COs with POs:

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| **CO4** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| **CO5** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |

*Suggested Readings*

- K. Sydsaeter and P. Hammond, *Mathematics for Economic Analysis*, Pearson Educational Asia: Delhi, 2002.
- Chiang, A. C.: *Fundamental Methods of Mathematical Economics*, Fourth edition, Mc Graw Hill 2005.
- Hoy, M.,J. Livernois, C. Mc Kena, R. Rees, andT. Stengos: *Mathematics for Economics*, PHI Publishers.
- Barua, Srinath: *Basic Mathematics and Its Applications in Economics*, Second Edition, Laxmi Publications 2013.
- Taha, Hamdy,A: "Operations Research",seventh edition, Pearson education Natarajan, Balasubramani and Tamilarasi:"Operations research" Pearson

# DIGBOI COLLEGE (AUTONOMOUS)
## FOUR YEAR UNDER GRADUATE PROGRAMME IN ECONOMICS (NEP)
DETAILED SYLLABUS OF 4$^{TH}$ SEMESTER

Course Title Course Title**: Statistical Methods for Economics**

Course Code**: MINECO404**
Nature of Course: **Minor**
Total Credits: **4 credits**
Distribution of Marks :**60 (End-Sem.)+40(In-Sem.)**

**Course Objectives:**   The objectives of this course are:

This course aims to enable the students to apply basic statistical concepts, including measures of central tendency and measures of dispersion in real life situations and to acquaint the learners with the understanding and application of probability theory, sampling, correlation, index number in real world situations.

**Course Outcome:**   Upon completing this course, students will be able to:

**CO1:**   Apply the fundamental concepts of descriptive statistics to summarize and describe the essential features of data.

LO1.1   Define and calculate measures of central tendency (mean, median, mode) and explain their significance.

LO1.2   Describe and compute measures of dispersion (range, quartile deviation, mean deviation, standard deviation).

LO1.3   Explain and calculate measures of skewness and kurtosis to understand data distribution.

**CO2:**   Conduct sampling and hypothesis testing to draw inferences about populations from sample data.

LO 2.1   Differentiate between sampling and census methods and describe various sampling techniques.

LO 2.2   Identify and distinguish between sampling and non-sampling errors in statistics.

LO2.3   Define statistical hypotheses, understand the distributions of test statistics, and differentiate between Type I and Type II errors.

LO2.4   Conduct and interpret hypothesis tests using chi-square, t-test, F test

**CO3:**   Apply probability theory to solve problems involving uncertainty and variability.

LO3.1   Explain basic probability concepts, including classical and empirical definitions, and solve problems using addition and multiplication theorems.

LO3.2   Analyze and apply conditional probability, independence of events.

LO3.3   Define and calculate mathematical expectation

**CO4:**   Analyze relationships between variables using correlation techniques

LO4.1   Explain and calculate covariance and interpret scatter diagrams.

LO4.2   Compute and interpret Spearman's rank correlation

LO4.3   Compute and interpret Karl Pearson's co-efficient of correlation.

**CO5:** Construct and interpret various types of index numbers for economic and business analysis.

    LO5.1    Explain the types and uses of index numbers.

    LO5.2    Construct index numbers using the simple aggregate method and the weighted aggregate method (Laspeyres, Paasche, Fisher's price index).

    LO5.3    Compute and understand deflating, splicing and base-shifting to discuss the problems involved in constructing index numbers.

    LO5.4    Analyze the applications of index numbers in economic and business contexts.

| Units | | L | T | Total Hours | Marks in End Sem |
|---|---|---|---|---|---|
| I | **Measures of Central Tendency and Dispersion** Measures of Central Tendency and their application: Arithmetic Mean, Geometric Mean, Harmonic Mean, Median and Mode, Measures of Dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation, Concept of Skewness and Kurtosis. | 13 | 2 | 15 | 12 |
| II | **Sampling and Testing of Hypothesis:** Sampling vs census, Methods of sampling, Errors in statistics: sampling vs. non-sampling errors, Testing of hypotheses: defining statistical hypotheses; distributions of Test statistics; Type I and Type II errors; Testing of hypothesis: chi square, *t* test and F test. | 13 | 2 | 15 | 12 |
| III | **Probability Theory** Probability: Basic Concepts, Classical and empirical definitions, Addition and Multiplication Theorems; Conditional Probability and Independence of Events; Mathematical Expectation. | | | | 12 |
| IV | **Correlation Technique** Elementary analysis of linear correlation: Scatter Diagram, Spearman's rank correlation, Karl Pearson's coefficient of correlation–Properties and the Method of Calculation | 13 | 2 | 15 | 12 |
| V | **Index Numbers** Types and uses; methods of constructing index numbers: simple aggregate method, weighted aggregate method – Laspeyres, Paasche and Fisher's price index; simple and weighted average of price relatives; problems in construction of index numbers. | 13 | 2 | 15 | 12 |
| | **Total** | **52** | 8 | 60 | 60 |

**MODESOFIN-SEMESTERASSESSMENT:**      **40 Marks**

- Two Internal Examinations   -     **20 Marks**
- Others (Any two)      -     **20 Marks**
  - Home assignment
  - Viva voce

- Seminar
- Group discussion
- Quiz

**Cognitive Mapping of Cos with Bloom's Taxonomy:**

| Cognitive Knowledge Dimensions | Cognitive process dimension | | | | | |
|---|---|---|---|---|---|---|
| | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** |
| **Factual Knowledge** | | | | | | |
| **Conceptual Knowledge** | CO1,CO2, CO3, CO4 | CO1,CO2, CO3,CO4, CO5 | CO1,CO2, CO3,CO4, | CO2 | CO3 | |
| **Procedural Knowledge** | CO1,CO2 | CO1,CO2, CO3 | CO1,CO2, CO3 | CO2,CO3, CO4 | CO3,CO4, | CO4 |
| **Metacognitive Knowledge** | | | | | | |

**Mapping of COs with POs:**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| **CO4** | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | |

*Suggested Readings*

- Jay L. Devor. *Probability and Statistics for Engineers*. Cengage Learning, 2010.
- John E. Freund. *Mathematical Statistics*. Prentice Hall,1992.
- Richard J. Larsenand Morris L. Marx. *An Introduction to Mathematical Statistics and its Applications*. Prentice Hall, 2011.
- William G. Cochra. *Sampling Techniques*. John Wiley, 2007.
- Gupta, S.C. *Fundamentals of Statistics*, Himalaya Publishing House
- Gupta, S.P. *Statistical Methods* .Sultan Chand and Sons