

**DEPARTMENT OF PHYSICS**  
**CBCS Syllabus for Autumn Semester-2016**

**3 Credits**

**PH-602: History of Physics**  
(Syllabus modified as per recommendation of experts)

Early History: Science and physics, ancient Greek civilization, Muslim scientists, medieval years, Indian and Chinese civilizations.

Scientific Revolution: Nicolaus Copernicus, Galileo Galilei, Johannes Kepler, Rene Descartes, Sir Isaac Newton, early thermodynamics.

Later Developments: Mechanics and its developments, thermodynamics and laws of thermodynamics, electricity and magnetism, James Clerk Maxwell, Maxwell equations.

Birth of Modern Physics: Radiation experiments, Albert Einstein and theory of relativity, special relativity, general relativity, development of quantum mechanics.

Contemporary Particle Physics: Standard model of particle physics, discoveries of particles, quark model, quantum field theory, quantum electrodynamics, quantum chromodynamics, beyond standard model, string theory, quantum gravity and super-symmetry, Higgs Boson.

Influential Physicists: [The instructor will discuss on minimum 10 influential physicists in different branches of Physics]

Optional topics:

- (i) A brief introduction to Philosophy of Science, including "falsification" by Karl Popper.
- (ii) Ten most famous experiments in Physics
- (iii) Ten most fundamental equations of Physics
- (iv) Scientific methodology

Text books:

1. Einstein A. and Infeld, L., *The Evolution of Physics*, (The Scientific Book Club, 1999).
2. Simony Karoly, *A Cultural History of Physics*, (CRC Press, Taylor and Francis, 2008).
3. Bernard C.I., *The Birth of a New Physics*, (W. W. Norton and Company, 2011).

References Books:

1. *Great books of the western world*, edited, (Encyclopedia Britannica Publications, 2010).
2. Agar, Jon, *Science in the twentieth century and beyond*, (Cambridge: polity press, 2012).
3. Ben-Claim, Michael, *Experimental philosophy and the birth of empirical science*, (Aldershot: Ashgate, 2004).
4. Dear, Peter, *The mathematical way in the scientific revolution*, (university of Chicago press, 1995).
5. Drak, Stillman, *Galileo at Work: His scientific biography*, (University of Chicago press, 1978).
6. Heilbron, J.L., *Electricity in the 17<sup>th</sup> and the 18<sup>th</sup> centuries*, (University of California press, 1979).
7. Jhiele, Pudiger, *Arabic Sciences and Philosophy*, (Cambridge University press, 2005).
8. Schweber, Silvan, *QED the man who made it*, (Princeton University press, 1994).
9. Kragh, Helge, *Quantum Generations: A history of physics in the twentieth century*, (Princeton University press, 1999).

IDC course						
Course code	Course Name	L	T	P	CH	Credit
EN 551	Energy and Environment	3	0	0	3	3

Global and National energy scenarios; Formation, extraction, and transformations of fossil fuels; Renewable such as biomass, solar and wind; and the electricity system; Power generation from different energy sources

Interaction of energy technologies with the environment; Environmental impacts of energy systems, technical options for transforming energy systems to reduce environmental impacts; Causes of global, regional and local climate change

Global warming; Green House Gas emissions, impacts, mitigation; Sustainability; Externalities, Future energy systems; Clean energy technologies; United Nations Framework Convention on Climate Change (UNFCCC); Sustainable development; Kyoto Protocol; Conference of Parties (COP); Clean Development Mechanism (CDM); Prototype Carbon Fund (PCF)

#### Text Book

- [1] Ristinen R. A. and Kraushaar J. J. (1998): *Energy and the Environment*, John Wiley
- [2] Loulou R. Waub J. P. and Zaccour G. (2005): *Energy and the Environment*, Springer

#### Referencè Book

- [1] Johansson T. B. (ed.) (1993); *Renewable energy: sources for fuels and electricity*, Earthscan
- [2] Sioshansi F. P. (2011): *Energy, Sustainability and the Environment*, Elsevier
- [3] Dincer I. and Rosen M. A. (2007): *Exergy: Energy, Environment and Sustainable Development*, Elsevier.
- [4] Chartier P. (et al.) (1997); *Biomass for Energy and the Environment*, Elsevier
- [5] Ravindranath N. H, Usha R. Natarajan K. B. and Monga P. (2000); *Renewable Energy and Environment - A Policy Analysis for India*, Tata-McGraw Hill

IDC course				
Course code	Course Name	L T P	CH	Credit
EN 553	Energy Conservation	3 0 0	3	3

Basic concept of energy and material flow: energy consumption pattern of important sectors. Energy conversion processes – chemical to thermal, chemical to electrical, kinetic energy to electrical etc.

Principles and need of energy conservation: economic and environmental implications. Practices of energy conservation in different sectors viz., industry, household, building, transport, agriculture and allied sectors – practical analysis of each category.

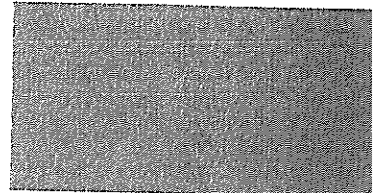
Tools and techniques for energy conservation: Case studies concerning sustainable resources, process and technologies.

#### Text Book

- [1] Kreith F. and West R. E. (1996); *Handbook of Energy Efficiency*, 1st edition, CRC Press
- [2] Doty S. and Turner W C. (2012); *Energy Management Handbook*, 8th Edition, The Fairmont Press

#### Reference Book

- [1] Thumann A. and Mehta D. P. ( 2008); *Handbook of Energy Engineering*, Sixth Edition, The Fairmont Press
- [2] Capehart B. L. Turner W. C. and Kennedy W. J. (2011); *Guide to Energy Management*, Seventh Edition. The Fairmont Press
- [3] Kao C. (1999); *Energy Management in Illumination System*, First Edition, CRC Press
- [4] Bureau of Energy Efficiency (BEE) (2012); Study material for Energy Managers and Auditors Paper I to IV.
- [5] Thumann A. Niehus T. and Younger W. J. (2012); *Handbook of Energy Audits*, Ninth Edition, CRC Press



**Choice Based Credit Transfer (CBCT)**  
Centre for Assamese Studies  
School of Humanities and Social Sciences  
Course Code: CA 204

Course Title: **HISTORY OF ASSAMESE LITERATURE**  
Course Credit: 3

Course Instructor: Sanjib Pol Deka

This course is meant for the post-graduate students of different disciplines. Students who desire to learn the history of Assamese Literature may opt for this course. The medium of instruction of the course will be English. As such, all those students who do not know Assamese may also register their names for the course. The course would teach them the outline history of the Assamese literature with special reference to select texts.

Unit-I: Pre-Sankaradeva Period

- (i) Hem Saraswati
- (ii) Madhava Kandali

Unit-II: Sankaradeva Period

- (i) Sankaradeva
- (ii) Madhavadeva

Unit-III: Nineteenth Century

- (i) Contributions of the missionaries
- (ii) Anandaram Dhekiyal Phukan
- (iii) Gunabhiram Barua
- (iv) Hemchandra Barua

Unit-IV: Romantic Period

- (i) Short Story  
Patmugi (Lakshminath Bezbaroa)
- (ii) Poetry  
Bin-baragi (Chandrakumar Agarwala)
- (iii) Critical Essay  
Namghosa (Banikanta Kakati)

Unit-V: Modern Period

- (i) Novel  
Jivanar Batat (Bina Barua)
- (ii) Short Story  
Bina-Kutir (Saurabh Kumar Chaliha)
- (iii) Poetry  
Jengrai-1963 (Ajit Barua)

**Prescribed Text:**

*History of Assamese Literature* by Birinchi Kumar Barua published by Sahitya Akademy, 1964.



Name of the Course (CBCT): FINANCIAL ACCOUNTING-THEORY AND PRACTICE  
(L 3-T 0-P 0 - CH 3 - CR 3)

**Unit 1: Introduction of Accounting**

Meaning and Scope of accounting; Objectives, nature and functions of accounting; Advantages and limitations of accounting; Accounting as a measurement and valuation principle; Accounting Principles; Accounting as an Information System; Basis of Accounting – Cash and accrual system of Accounting; Branches of accounting; Accounting and management control.

**Unit 2: Basic Accounting Process**

Accounting process from recording of transactions till preparation of Trial Balance-Concept of assets, liabilities, capital, income and expenses; Balance Sheet equation; Classification of receipts/income and payments/expenditure into capital and revenue; Rules for Debit and credit; recording of transactions; The Journal and subsidiary books, ledger accounts- posting of transactions; Adjusting entry; Bank Reconciliation Statement.

**Unit 3: Trial Balance and Final Accounts**

Trial Balance – meaning and importance, adjusted trial balance, Difference in Trial Balance; Errors and rectification entries thereof.

Need for measurement of income, Realization principle vs. Accrual principle; accounting period, Matching revenue and expenses.

Manufacturing Account, Trading Account, Concept of Gross profit and Net profit,, Need and meaning of Profit and Loss Account, Forms and contents of Profit and Loss Account, Concept of Balance Sheet, Classification of items in a balance sheet; Format of Company Balance Sheet, Preparation of Final Accounts; Cash Flow statement.

Accounting for depreciation; method of inventory valuation

**Unit 4: Accounting Standards and emerging concepts in Accounting**

Introduction to Accounting Standards and IFRS converged Ind AS, Human Resource Accounting, Corporate Social Accounting etc.; computerized Accounting System and accounting software,

**Unit 5: Study of Annual Reports of Companies; Analysis, interpretation and Judgment building**

*(Assignment based)*

Text Books:

1. Ramachandran, N. and Kakani, R.K. Financial Accounting for Management. 3/e, TATA McGraw-Hill Education Pvt. Ltd: Noida, 2011.
2. Bhattacharjee Ashis K. Financial Accounting for Business Management. Prentice Hall India: New Delhi, 2006.

Reference Books:

1. Anthony Robert N., Hawkins David, Merchant Kenneth A. , Financial Accounting-Text and Cases, McGraw-Hill Higher Education; 13 edition (1 June 2010)