

## Subject Specific Refresher Courses

The following Subject Specific Refresher Courses have been assigned by the UGC to UGC-HRDC, JU, for the academic session 2018-19:

Sl. No.	Title	Course Date
1.	Quantitative Techniques in Economics: Methods and Application in Micro-econometrics <b>(Subject: Economics)</b>	12 <sup>th</sup> November-4 <sup>th</sup> December, 2018
2.	Social and Political Philosophy: Indian and Western <b>(Subject: Philosophy)</b>	28 <sup>th</sup> November-18 <sup>th</sup> December, 2018
3.	Indian Life and Culture Revealed in Ancient and Early Medieval Literature <b>(Subject: Sanskrit)</b>	27 <sup>th</sup> August-15 <sup>th</sup> September, 2018
4.	Recent developments in Physics: Theory and Experiment <b>(Subject: Physics)</b>	19 <sup>th</sup> November-11 <sup>th</sup> December, 2018
5.	Power Electronics: Devices, Applications and Power Quality Issues <b>(Subject: Electrical Engineering)</b>	28 <sup>th</sup> December, 2018-19 <sup>th</sup> January, 2019
6.	Recent Advancement in Food and Bioprocess Technology <b>(Subject: Food Technology &amp; Bio-Chemical Engineering)</b>	2 <sup>nd</sup> January-22 <sup>nd</sup> January, 2019

## Concept Note

### **Quantitative Techniques in Economics: Methods and Application in Micro-econometrics**

This refresher course aims at introducing young College and University faculties to the methods and techniques of Micro-econometrics that deals with individual level data on the behaviour of different economic agents like firm and households. As it deals with individual level data, it is concerned with non-continuous dependent variables (discrete, count data, qualitative censored), selection bias, non-observable latent variables, non-measurable variables and other cases. Micro-econometric analysis immensely contributes towards policy formulation, evaluation of policy measures, testing hypothesis on behaviour of individuals, firms and households, marketing and firm level study and on related fields. The data structure under study can be cross section data, panel data or event data.

The present refresher course will provide a comprehensive coverage on concepts and estimators that are central to the micro-econometrics. The participants will be given exposure to micro-econometric data analysis using STATA software. Eminent economists and econometricians will deliver lectures and impart practical knowledge on tool and techniques of micro-econometrics.

The tentative topics that will be covered are as follows:

- A. Extraction of Data: (NSSO Data, NFHS Data DLHS Data)
- B. Non-linear models
- C. Count data models
- D. Discrete choice models :
  1. Truncated and censored regression models.
  2. Duration models.
  3. Quantile regression.
  4. Variance estimation and power.
  5. Bootstrapping.
  6. Non-parametric regression and matching.
  7. Heckman bivariate normal selection model.
  8. Instrumental variables models.
  9. Regression discontinuity designs.
  10. Difference-in-differences and
  11. Panel data models.

All these theoretical topics will be supplemented by laboratory session with STATA software.

We believe that, this refresher course would immensely help participant in analyzing and estimating models using topics to be covered under the course and they can also encourage their students to do so.

The Department of Economics, Jadavpur University being a Centre for Advanced Study has enough infrastructural support as well as technical expertise to organize this kind of refresher course on applied economics. The Department already teaches certain statistical packages including STATA at the Postgraduate Economics course. Thus, we firmly believe given the available infrastructural facilities of the Department the participants will be vastly benefited from this course.

## Concept Note

### **Social and Political Philosophy: Indian and Western**

Man is a social and political being by his very nature and necessity. The participation in collective life under some form of authority is as old as human life itself. The growth of a human being centers on its relationship with society and its fellow beings. Society is not a mere assimilation of a group of people who assemble together for survival. When we talk about society, we also talk about social and political institutions which both shape us and are shaped by us. We also talk about the social problems, the norms or principles that establish and justify societies and determine the rights and responsibilities of a society in relation to its own members, of the members in relation to each other and to society as a whole. The study of such principles or norms or social issues eventually attracts our focus to the concepts underlying the emergence and growth of such questions. As we see the eventual growth of society, we also see emergence of new social issues as well as a reformed and rebuilt approach towards the traditional issues. Right from the Greek period, philosophers like Plato and Aristotle have gone deep into the concepts of ideal society, the relation between the individual and state. The debates and discussions on the above mentioned issues gave birth to related issues of authority, control, citizenship, obligation, justice and so on. Thus the important questions that have disturbed the social scientists of different periods are,

- ❖ Ideal form of society or state
- ❖ Relation among different societies
- ❖ Relation between individual and state, e.g., how states and other institutions affect individual life and vice-versa?
- ❖ Nature of social justice
- ❖ Nature of social responsibility and many more

Unlike other social scientists the philosophers have focused on the conceptual aspects of these issues. The conflict among different theories gave birth to different ideologies like Anarchism, Socialism, Individualism, Liberalism, Conservatism etc. Philosophers are always concerned with the normative foundations of these theories and this concern resulted in theories like Perfectionism, Virtue Ethics, Utilitarianism, Conceptualism and many more. However, justice is one of the core concepts that have been addressed right from the Greek period till date. Thus we have theories like egalitarianism, libertarianism, need and distributive justice, capability approach, global justice and so on.

Needless to mention that the post-modern movement has opened up new avenues and perspectives. It is important to situate our study in the present context and thus delve into the issues through the lens of global as well as marginalized perspectives.

This refresher course aims to focus on all the concepts, principles, issues which regulate the individuals and society. The course would like to consider the traditional as well as contemporary approach in both Indian and Western perspectives.

## **Concept Note**

### **Indian Life and Culture Revealed in Ancient and Early Medieval Literature**

From the very early period of civilisation in India, religion and culture emerged in its soil are dynamic in nature in the present day life also. So, continuous evolution is the key feature of the Indian civilization.

As we take the Indian literature for discussion, such consistency is forceful and for this reason, it reaches an ultimate peak of quality. Moreover, the then contemporary Indian literature of various ages i.e., Vedic, Sanskrit, Pali, Prakrit, Epigraphic works etc. became the great treasure to know social, economic, political and cultural history of the people of India.

The Vedic literature is the earliest literary document in Indian history and the Ṛgveda is regarded as the first share therein. So the Vedic literature is the primary source for understanding the then contemporary social life and culture of India. Consequently, the two great epics i.e., Rāmāyaṇa and Mahābhārata and various Purāṇas emerged and they became the main source to know all the spheres of people's life. Various groups of people came to India through ages and they became the part and parcel of this country. Epic, Drama, Prose Romance, Lyrics, Poetics, Metrics, Grammar, Philosophy- all kinds of literary works (both in Sanskrit and in Prakrit) inform us that the religion, social rites, customs, beliefs etc. were accepted and followed by all the immigrated groups of people in India. So, despite diversity social harmony became the ultimate conclusion in this part of the globe.

In the remote past, wherever in the world civilisation emerged, earlier culture could not retain in the modern time. But in India, civilisation, culture and religion of ancient time are continuing till date and that is why the topic of the course as decided by BOS, Department of Sanskrit, is pertinent in present time also.

## **Concept Note**

### **Recent developments in Physics: Theory and Experiment**

Physics is one of the oldest academic disciplines and, through its inclusion of astronomy, perhaps the oldest one. Physics intersects with many interdisciplinary areas of research, such as biology and quantum chemistry, and the boundaries of physics are not rigidly defined. New ideas in physics often explain the fundamental mechanisms studied by other sciences and suggest new avenues of research in academic disciplines such as mathematics and philosophy.

In recent times, advancement has been made in different areas of physics; primarily in experimental physics it is tremendous. The main objective of this course is to provide an idea about the recent advances in different frontier areas in theoretical and experimental physics.

Every now and then, new specializations are emerging in physics, opening new frontiers and thereby leading to new findings and technologies. Experimental physics has not only helped us in pushing the frontiers of knowledge by unfolding the mysteries of nature, but also led to the creation of many new and useful technologies. For example, the LIGO is a large-scale physics experiment and observatory to detect cosmic gravitational waves and to develop gravitational-wave observations as an astronomical tool. Breakthroughs in the area of non-conventional energy research opened up the possibility of moving beyond our current alternatives for energy supply by introducing technologies that are more efficient, inexpensive, and environment-friendly. The use of a wide array of sophisticated instruments and techniques has helped biology to change from a descriptive science to an analytical one. Participants, further, will be introduced to different teaching and state-of-the-art research laboratories of the department wherefrom they will get hands-on training on selected areas in experimental physics.

It will help the participants to gain deep insights into various branches of theories and hone their skills on experimental physics and to fulfill their role as better teachers and researchers. Lectures will be delivered by the reputed scientists working in these frontier areas of Physics.

## Concept Note

### **Power Electronics: Devices, Applications and Power Quality Issues**

#### **Introduction:**

In recent years, the field of power electronics has experienced a large growth due to confluence of several factors. Revolutionary advances in microelectronic methods have led to the development of efficient controllers for controlling electric power flow. These advances in semiconductor fabrication technology have made it possible to significantly improve the voltage and current handling capabilities and the switching speeds of power semiconductor devices as a result of which the emergence of power processor units have become a reality. At the same time, the market for power electronics has significantly expanded. With fast developments in semiconductor technology, high performance power electronic devices and signal processors are getting commercialized regularly. Consequently power electronics, machines drives and power system technologies are advancing very fast. So there is a necessity for updating the knowledge on state-of-the-art developments in these fields. The present course, therefore, is aimed at the direction of presenting all such recent developments before the participants.

#### **Course Contents:**

Introduction, structure, characteristics and applications of power electronic devices, A.C. to D.C. and D.C. to A.C. converters, different PWM techniques, SMPS.

Introduction and basic operating principles of D.C. and A.C. motor drives, slip power recovery drives, dynamic  $d-q$  model of A.C. machines. Vector Control of three phase induction motor, Field Oriented Control of three phase induction motor drives, application of power electronics in power system and HVDC transmission, synchronous motor drives. Role of processors and DSP in power electronic applications. Introduction to PLC for motor drives and applications of sensors.

Power Quality issues, different harmonic reduction techniques, series and shunt compensators, FACTS, STATCOM, UPFC, Active and Passive Filters, Active and Reactive Power Control, Static VAR compensator.

## **Concept Note**

### **Recent Advancement in Food and Bioprocess Technology**

The need of the modern society is safe and consistent quality products and services at affordable prices. Industries which are engaged in manufacturing biomaterials such as food, enzymes, antibiotics, agricultural products or bioprocess industries which are involved in the production of alternative treatments products for diseases, the creation and evaluation of safer food materials or the formulation of biodegradable and environmental-friendly chemicals from low-priced raw materials desperately demand translating developments in the field of food and bioprocess technology into practical applications.

Manufacturing a good food product is not enough in terms of quality and reliability. Therefore the method employed in quality control programme within the food industry will vary considerably in accuracy and sophistication according to type of process, size and raw materials available. Quality of food has to be ensured for safety and health reasons. It is a prerequisite for marketing and export so it has to be maintained for consumer protection. The concept of continuous improvement of quality of food has now a day been influenced by the new technological advancement.

Bio processing involves the utilisation of modern techniques for production of industrial commodities and products such as enzymes, biopolymers, organic acid, vitamins, bio fuels, bio fertilizers and others. The domain of bio processing has great significance because this offers potential environmental and economic benefits associated with reduced energy consumption.

Therefore the emerging technologies and scientific advancements in the fields is the fundamental force that drives the development and implementation of industrials process at lower operating and capital expenditure and ultimately improves market economy.

The objective of the present refresher course for the university and college teachers on the topic 'Recent Advancement in Food and Bioprocess Technology' is to provide an effective platform for cutting-edge knowledge refreshment among the teachers. This may, in turn, make them able to impart time-d demanded skills and education more effectively to their students who are supposed to serve our society in future. In addition, this may help the faculty members to initiate or enrich scientific research in thrust areas.

Thus, the course is designed to address the new perspectives to established processes, innovative and emerging technologies, and trends and future research in the identified domain leading towards development of knowledge and inspirations. The invited speakers will be recognized experts or knowledgeable practitioners from industry, government, research institutes, colleges and universities.