

Abstract Book

**Summary of Lectures
Delivered at 74th Orientation Programme
August 26 - September 16, 2019**

**UGC-Human Resource Development Centre
Jadavpur University**

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Director's Note

The UGC-Human Resource Development Centre, Jadavpur University, is organizing the 74th Orientation Programme, the first among the four such programmes sanctioned by the UGC in the session 2019-20.

Like the previous Orientation Programmes, we have organized a study tour at Satyajit Ray Film and Television Institute (SRFTI) Kolkata, for the participants of 74th Orientation Programme. In this study tour the participants would get first-hand experience in direction, sound, cinematography, editing and animation through a guided tour of different units of SRFTI, which they would thereafter document in terms of reports. My sincere thanks go to Debamitra Mitra, Director of SRFTI Kolkata and Ashok Viswanathan, Dean, SRFTI Kolkata, for arranging such an important study tour for the participants of the 74th Orientation Programme.

While selecting topics of the lecture sessions, three criteria have been kept in mind: topics of current affairs of national as well as international importance (such as Disaster management); topics of general interest for moral, psychological and professional development (such as lectures on stress management, research methodology, CAS/service matters, general financial rules); and topics of cross-discipline and multi-discipline in nature (such as lectures on, philosophy and history of science, Media Studies). On top of all these, there has been one session on performing arts with live demonstration.

This Abstract Book collates summary of most of these lectures delivered by experts and eminent researchers in the relevant fields both from within and outside West Bengal. The summary lectures are arranged thematically according to the above-mentioned perspectives. I hope that the participants of the 74th Orientation Programme would find this Abstract Book useful for ready references of what they have learnt through this programme.

On January 20, 2018, we have achieved a milestone by launching our own website (www.hrdcju.in) and from the session of 2018-19 the application procedure has become on line both of which have been the first of their kind among all the HRDCs in West Bengal. I sincerely thank the University administration for all the help that has been provided to us in this regard. The e-copies of this Abstract Book as well as the earlier ones can be downloaded from link to Archive in this website. Apart from providing all necessary information regarding different programmes organized by us along with time lines and application forms, the website contains a feedback link which can be used by the participants and other stakeholders for providing us their valued suggestions. Such suggestions would help us improve our performance and discharge our moral responsibilities more efficiently and effectively according to the needs of the stakeholders.

At the end, I wish all the participants a memorable and enjoyable four weeks of interactive learning.

September, 2019

Rajat Acharyya

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Schedule for 74th Orientation Program (Aug 26th- Sept 16th, 2019)

| Date | 10:30 AM – 12:00 Noon | 12:00 Noon – 1:30 PM | 2:15 PM – 3:45 PM | 3:45 PM – 5:15 PM |
|----------------------------|---|-------------------------------|---|---|
| Aug 26 Monday | Inauguration Session: 10:45 am: Welcome Address by Dr. Snehamanju Basu , Registrar, JU, 11:00 am - 12:30 pm: Inaugural Address by Prof. Basab Chowdhury 12:30 pm - 12:45 pm: Tea Break 12:45 pm: Introduction to the OP Dr. Nandan Bhattacharya, Asstt. Director & Mr. Prabir Kr. Chatterjee, Section Officer, UGC-HRDC | | Santanu Biswas Department of English, JU <i>Psychoanalysis and mental health</i> | |
| Aug 27 Tuesday | Subir Mukherjee Department of Geology, JU TBA | Lab & Library Work | Sanjay Mukhopadhyay Retired Professor, Department of Film Studies, JU <i>Documentary Film and Painting: The Crisis of Representation</i> | |
| Aug 28 Wednesday | Bichitra Kumar Guha Dean, Faculty Affairs, IEST <i>Evolution of Scientific Ideas from Aristotle to Newton</i> | | Amitava Datta Department of Power Engg. JU <i>Efficient Operation of LPG Cook-stoves in Domestic Households</i> | Sadhan K Ghosh Dean, FET JU TBA |
| Aug 29 Thursday | Study Tour at SRFTI | | Study Tour at SRFTI | |
| Aug 30 Friday | Somnath Ganguli Department of Physiology, CU <i>Ergonomics</i> | | Debi Chatterjee Department of IR, JU <i>Human Rights</i> | Lab & Library Work |
| Aug 31 Saturday | Ramaprasad Bhattacharya Joint DPI, GoWB <i>CAS/Service matters</i> | | Gour Krishna Pattanayak FO, JU <i>Basic Financial Rules and Service Related Rules Applicable for the College and University Teachers</i> | |

Lunch Break: 1:30 PM – 2:15 PM

| Schedule for 74th Orientation Program (Aug 26th- Sept 16th, 2019) | | | | |
|---|---|---|--|--------------------------|
| Date | 10:30 AM – 12:00 Noon | 12:00 Noon – 1:30 PM | 2:15 PM – 3:45 PM | 3:45 PM – 5:15 PM |
| Sept 02 Monday | Dr. Sankar Nath Oncologist <i>Cancer</i> | | <i>Lab & Library Work</i> & <i>Submission of report on Study Tour</i> | |
| Sept 03 Tuesday | Pradip K. Ghosh Pro VC, JU <i>Some Aspects of Philosophy of Science</i> | <i>Lab & Library Work</i> & <i>Submission of report on Survey based Group Project & Discussion & Evaluation</i> | Monaj Mitra Former Dean, FET, JU TBA | |
| Sept 04 Wednesday | Manjusha Majumder Department of Mathematics, CU <i>History of Development of Modern Differential Geometry</i> | | Chittaranjan Patra Principal Scientist Department of Applied Biology, CSIR-Indian Institute of Chemical Technology <i>Nanomedicine for Biomedical Applications: Opportunities and Challenges</i> | |
| Sept 05 Thursday | Survey based Group Project & Discussion & Evaluation & Evaluation of Group Project & Discussion | | Survey based Group Project & Discussion & Evaluation & Evaluation of Group Project & Discussion | |
| Sept 06 Friday | 'Experiential Learning' under Mahatma Gandhi National Council of Rural Education Mukti Pada Sinha and D. K. Chakraborty | | 'Experiential Learning' under Mahatma Gandhi National Council of Rural Education Mukti Pada Sinha and D. K. Chakraborty | |
| Sept 07 Saturday | 'Experiential Learning' under Mahatma Gandhi National Council of Rural Education Mukti Pada Sinha and D. K. Chakraborty | | 'Experiential Learning' under Mahatma Gandhi National Council of Rural Education Mukti Pada Sinha and D. K. Chakraborty | |

Lunch Break: 1:30 PM – 2:15 PM

| Date | 10:30 AM – 12:00 Noon | 12:00 Noon – 1:30 PM | 2:15 PM – 3:45 PM | 3:45 PM – 5:15 PM |
|-----------------------------|--|--|--|---|
| Sept 09 Monday | Swapnendu Bandyopadhyay Department of Economics, JU <i>Games that we play</i> | | Anupama Roy Department of Political Science, NUJS <i>TBA</i> | <i>Submission of report on Study Tour</i> |
| | <i>Holiday</i> | | <i>Holiday</i> | |
| Sept 11 Wednesday | <i>Lab & Library Work</i> | | Seminar Presentation and Evaluation | Seminar Presentation and Evaluation |
| Sept 12 Thursday | Seminar Presentation and Evaluation | Seminar Presentation and Evaluation | Seminar Presentation and Evaluation | Seminar Presentation and Evaluation |
| Sept 13 Friday | Seminar Presentation and Evaluation | Seminar Presentation and Evaluation | Microteaching | |
| Sept 14 Saturday | MCQ | | Harekrishna Halder RBU <i>Sreekhola</i> | |

| Date | 10:30 AM – 12:00 Noon | 12:00 Noon – 1:30 PM | 2:15 PM – 3:45 PM | 3:45 PM – 5:15 PM |
|--------------------------|---|-----------------------------|--|--------------------------|
| Sept 16 Monday | Valedictory Session 11 am – 12:30 pm: Valedictory Lecture by Prof. Utpal Bhadra Functional Genomics and Gene Silencing Group, SCIR-CCMB | | Feedback and Interactive Session Certificate Distribution and Disbursement of Payment) | |

Lunch Break: 1:30 PM – 2:15 PM

UGC – Human Resource Development Centre
Jadavpur University
74th Orientation Program
(Aug 26th - Sept 16th, 2019)

Survey based Group Project & Discussion & Evaluation

1. Time slot of Group Discussion: **05.09.2018 at 10:30 AM - 1:30 PM & 2:15 PM - 5:15 PM**
2. Presentation shall be made for **30 Minutes** followed by interaction for **10 Minutes**.
3. Presentation shall be made according to the following order.
4. Write up (**12 TNR; Single spacing**) on the topic must be submitted on **03.09.2018 (5:15 PM)**

Distribution of Group Discussion topic for participants

| Gr. | Name | Subject | No. | Topic |
|-----|------------------------|------------------------|-----|--|
| A | Arup Kumar Ghosh | Zoology | 8 | Cloning: An ethical perspective |
| | Iftikar Hossain Sardar | Zoology | | |
| | Kankana Basu | Zoology | | |
| | Nabanita Ghosh | Zoology | | |
| | Samik Bindu | Zoology | | |
| | Tamal Das | Physiology | | |
| | Piyali Das | Anthropology | | |
| | Niladri Purkait | Science | | |
| B | Kirat Kumar Ganguly | Microbiology | 7 | Is GMF is destroying indigenous variety |
| | Shakuntala Ghorai | Microbiology | | |
| | Sharmistha Basu | Botany | | |
| | Soma Chanda | Botany | | |
| | Rabindra Nath Hansda | Vet. Pathology | | |
| | Asit Kumar Maji | Vet. Surg. & Radiation | | |
| | Abdul Motin Ostagar | Leather Technology | | |
| C | Biswajit Samaddar | Geography | 6 | Forecasting Natural Calamities |
| | Nabendu Sekhar Kar | Geography | | |
| | Nasim Aktar | Geography | | |
| | Sarbeswar Haldar | Geography | | |
| | Dipanjan Bhattacharjee | Geology | | |
| | Sohini Roy | Geology | | |
| D | Ritaban Chatterjee | Physics | | Nuclear Research: A threat of war or way to prosperity |
| | Ruma Das | Physics | | |
| | Suchetana Chatterjee | Physics | | |
| | Partha Ray | Mathematics | | |
| | Mohsin Islam | Mathematics | | |
| | Shubhabrata Das | Mathematics | | |

| E | Partha Garai | Computer Application | Artificial Intelligence |
|---|---------------------------------------|------------------------|----------------------------|
| | Dipanwita Chakraborty Bhattacharya | Computer Science | |
| | Probir Mondal | Computer Science | |
| | Himadri Sekhar Dutta | ECE | |
| | Partha Sarathi Das | Electronics | |
| | Ramaprasad Maiti | Electronics | |
| | Rijaul Haque Mirdha | Electronics | |
| | | | |
| F | Sanghamitra Sarkar | Architecture | Technology and Development |
| | Md. Wasim Akram | Civil Engineering | |
| | Hareram Lohar | Mechanical Engg. | |
| | Shouvik Ghosh | Mechanical Engg. | |
| | Subha Mondal | Mechanical Engg. | |
| | Dipten Maiti | Electrical Engineering | |
| | Mihir Hembram | Electrical Engineering | |
| | | | |

**ABSTRACT
OF LECTURES
DELIVERED**



CAS/ Service matters/

CAS/ Service Matters

Ramaprasad Bhattacharya
Joint DPI, Govt. Of West Bengal

Date & Time: 31st August, 2019; 10.30 AM - 1.30 PM

- Enrolment of students in Higher Education in West Bengal is 17%.
- O.P./R.C. is just not a personal requirement. It should be a social responsibility for a teacher to prepare the students. These programmes are designed to serve this purpose.
- Gap between O.P. and R.C. is conventionally one year, but it is not strictly maintained in West Bengal scenario.
- Publication and other criteria are more important and necessary for API Score than Orientation Programme / Refresher Course.
- UGC-listed journals are recommended for publication, but non-listed journals are also taken into consideration.
- Financial support for Projects can mainly be obtained from four sources viz. DST Central, DST State, UGC, Government of West Bengal.
- Number of classes per week is flexible and it depends on number of teachers present at the department.
- Government Colleges are treated or recognized as cadre-based service, but Government-Aided colleges are different. Therefore, the rules and regulations of service continuation and promotion is different depending on the change of service-criteria, namely Govt. To Govt., Govt. To Non-Govt., Non-Govt. To Non-Govt. And Non-Govt. To Govt. Colleges.

Basic Financial Rules and Service Related Rules Applicable for the College and University Teachers

Gour Krishna Pattanayak
Finance Officer, Jadavpur University

Date & Time: 31st August, 2019; 2:15 PM – 5:15 PM

General Financial rules normally includes sanction process, budgeting, spending norms, purchase rules, service benefits, pay and promotion issues and taxation matters, to name a few. The present lecture primarily focuses on these aspects.

Budgeting is essentially estimates for the future period based on past experiences, and flow of funds and expectations thereof. The principle of budgeting is essentially setting some benchmarks for future plan of growth and development. For academic institutes, the main source of funds is funding by the State and Central Governments and other agencies. In addition, there are incomes/revenues generated through fees, testing and consultancy, sale of publications, alternative use of properties and assets, and disposal of junk and other materials.

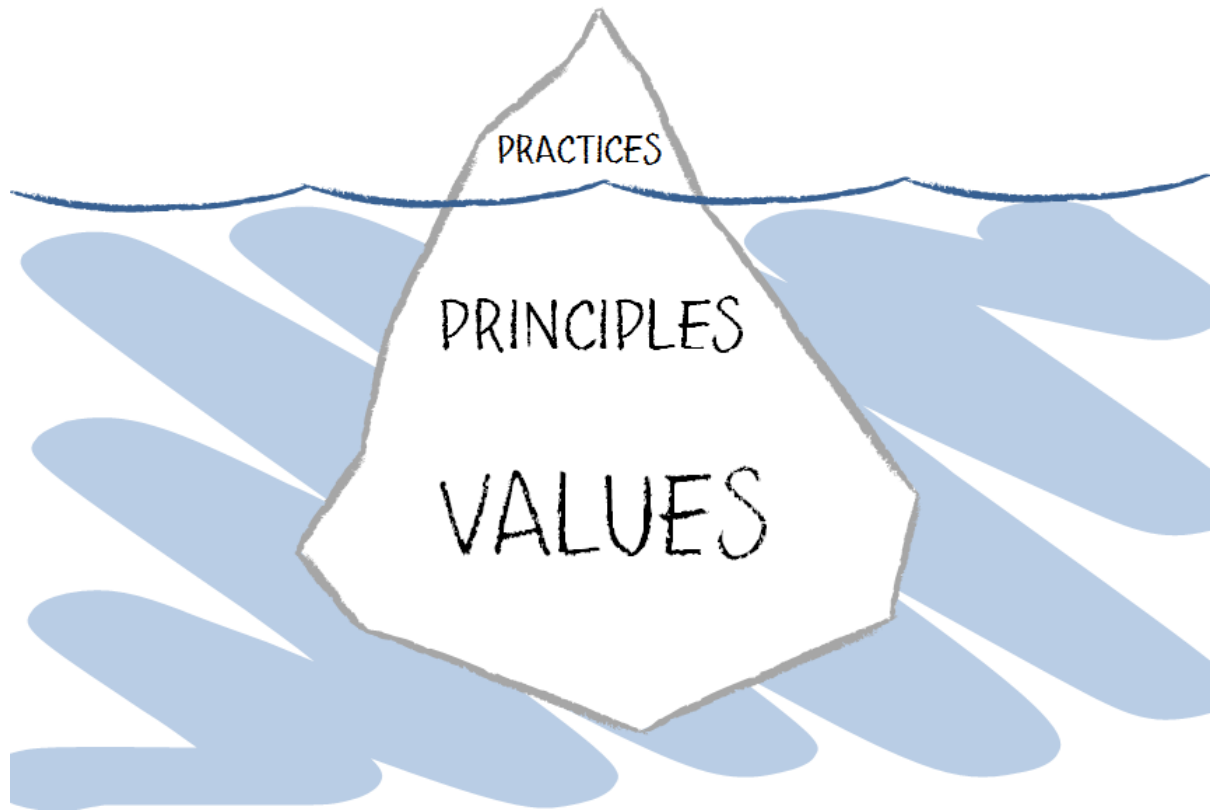
Purchase and expenditure thereof are primarily intended for academic and research activities and primarily within budgetary allocations and/or sanctions. The purchase of materials, equipment and furniture are now governed by GO No.: 5400-F(Y) dated 25.6.2012 of Government of West Bengal.

Accounting, reporting and auditing are the other crucial elements of general financial rules. In this context, introduction of GST has added another dimension to accounting of purchases. The present lecture shall briefly touch upon the scope, applicability, rationality and impact of GST.

The lecture also elaborate upon Service Rules, particularly pay fixation and promotion, promotion under CAS, retirement benefits and the new Pension Scheme introduced by the GoI with effect from 01.01.2004. Salient features of this pension scheme are as follows:

- This is a contributory Pension scheme, introduced w.e.f. 2004; 10% of Basic Pay as subscription and matching equal contribution by the employer will be provided monthly.
- A Pension fund will be maintained by a Fund Manager, where monthly the subscription and contribution need to be send by a employer.
- The employer shall have no liability for Pension of the employees under the scheme.
- The Fund manager shall release Pension monthly, based on the income on the accumulated funds with them.

- Such Pension would not have any DA or Pay-revision benefits.
- The employer has no financial liability for pension after the retirement.
- The fund manager receiving the funds will pay monthly pensions.
- There is a permanent Retirement Account number [PRAN], which is transferable.
- The scheme is controlled by PFRDA.



Value, Ethics and Human Rights

Human Rights: Some Conceptual Issues and the Roots of Vulnerability

Debi Chatterjee

Department of IR, Jadavpur University

Date & Time: 30th August, 2019; 2:15 PM - 3:45 PM

Any discussion on human rights must start with an understanding of the concept of human rights: its meaning and its contextual setting. Even as it is rooted in the rights discourse, the notion of human rights stands out for its distinctiveness, marking a qualitative difference.

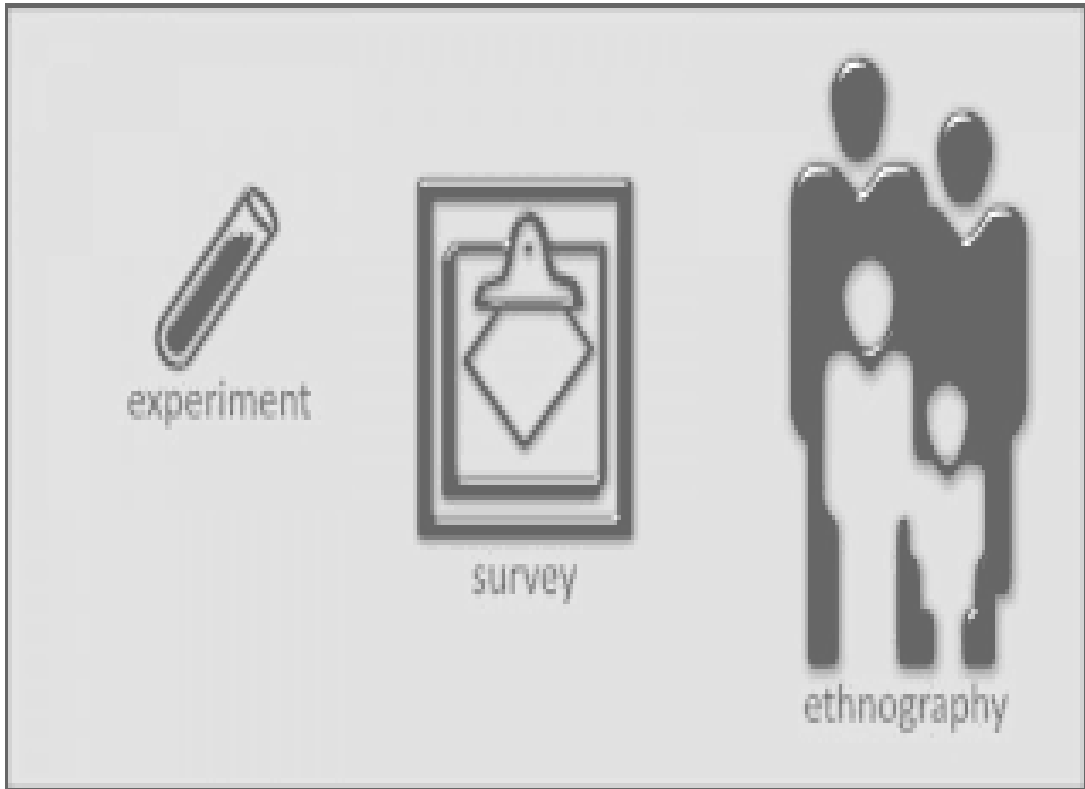
Central to the idea of human rights is the idea of human dignity which inevitably calls for an acknowledgement of the indivisibility and interdependence of different economic, social, cultural, civil and political rights. As such, it goes beyond the understanding of individual rights, per se. From rights to human rights is indeed a qualitative leap !

The global context in which the human rights discourse emerged is significant. The Second World War, the establishment of the UN, the fears and concerns of the international community and the early attempts at codification of human rights followed by a host of subsequent developments in the field, all laid the ground for the development of the human rights discourse.

Today, in the 21st century, on the one hand there is an increasing awareness of human rights across the world to an extent that has never been witnessed before. Global networking has greatly facilitated the process. Across the world dissemination of information on human rights violations, widespread mobilization by the human rights organizations to counter such violations is generating an overall increase in consciousness pertaining to rights.

On the other hand, the passage of the century is witnessing manifold increase in violations of human rights. The rights are being undermined by the voracious appetite of industrial and technological growth in the name of globalization, the arrogance that goes with the expansion of military power, the largely unabated growth of a single super power – the USA, and the worldwide witch-hunt in the name of combating ‘terror’.

In our lecture we shall , further, turn to the question of vulnerability and attempt to unravel its roots. While human rights of all individuals may be violated, all are not equally vulnerable. Some remain more vulnerable than others. We shall try to identify those who are the most vulnerable to human rights violations, globally as well as in India: what causes their vulnerability and how it is constructed; important in the analysis would be the role of the state, international community and the UN.



Methodology

Games that we play

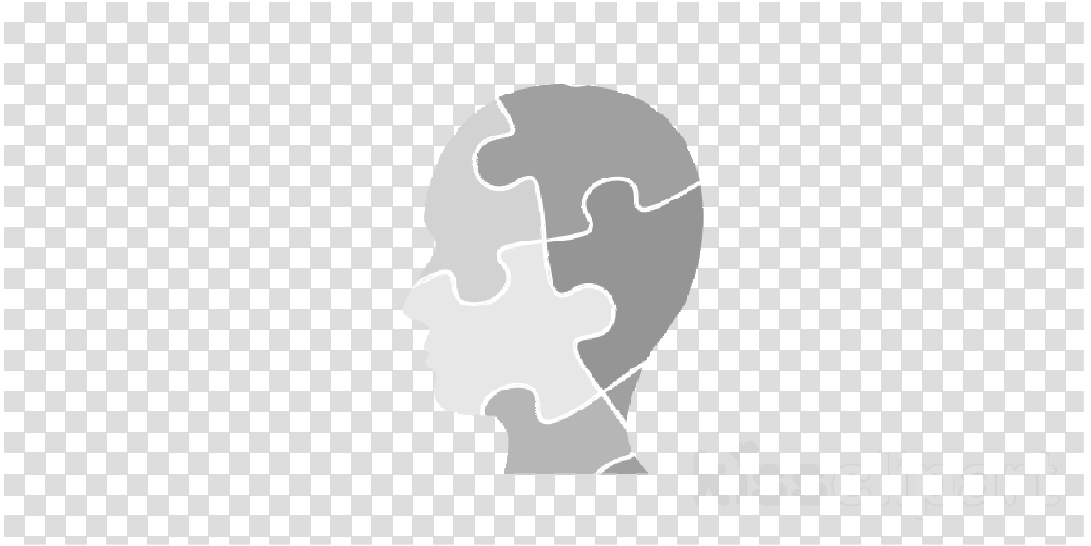
Swapnendu Banerjee

Department of Economics, Jadavpur University, Kolkata

Date & Time: 9th September, 2019; 10:30 AM – 1:30 PM

In the late thirties, mathematician John von Neumann turned his prodigious innovative talents towards economics. This brief encounter of his with the day's economic theory convinced him that it was in need of a new mathematical tool. In the years that followed, he along with Oskar Morgenstern went about creating a brand new mathematical tool which was offered to the profession in their now classic book 'Theory of Games and Economic Behavior' published in 1944. In this book, they developed the concept of 'two-person-zero-sum' games and other cooperative game theoretic concepts. But soon economists found out that the phenomenon of 'one person's gain is the other person's loss' was too restrictive in many applications. Later John Nash took the next giant step and gave a solution concept for broader class of games which need not be zero-sum. Thus 'Nash Equilibrium' revolutionized what we now know as the 'modern non-cooperative game theory' and laid the foundation for further development in the field.

Game theory (non-cooperative) is sometimes known as interactive decision theory. It deals with situations where people with different (mostly competing) goals try to take into account others' actions in deciding on the optimal course of action. Game Theory has wide applications in Economics, Computer Science, Biology, Political Science, Sociology and other social sciences. In the first part of the lecture we will talk about static games of complete information and dynamic games of complete information. Static games are simultaneous move games and Dynamic games are sequential move games. We will look into relevant solution concepts of the above mentioned games (viz. Nash Equilibrium and others). In the second part of the lecture we will play some games in the class. This will enable the participants to grasp the solution concepts of a varied class of games.



Stress Management, Counselling and Psycho- analysis

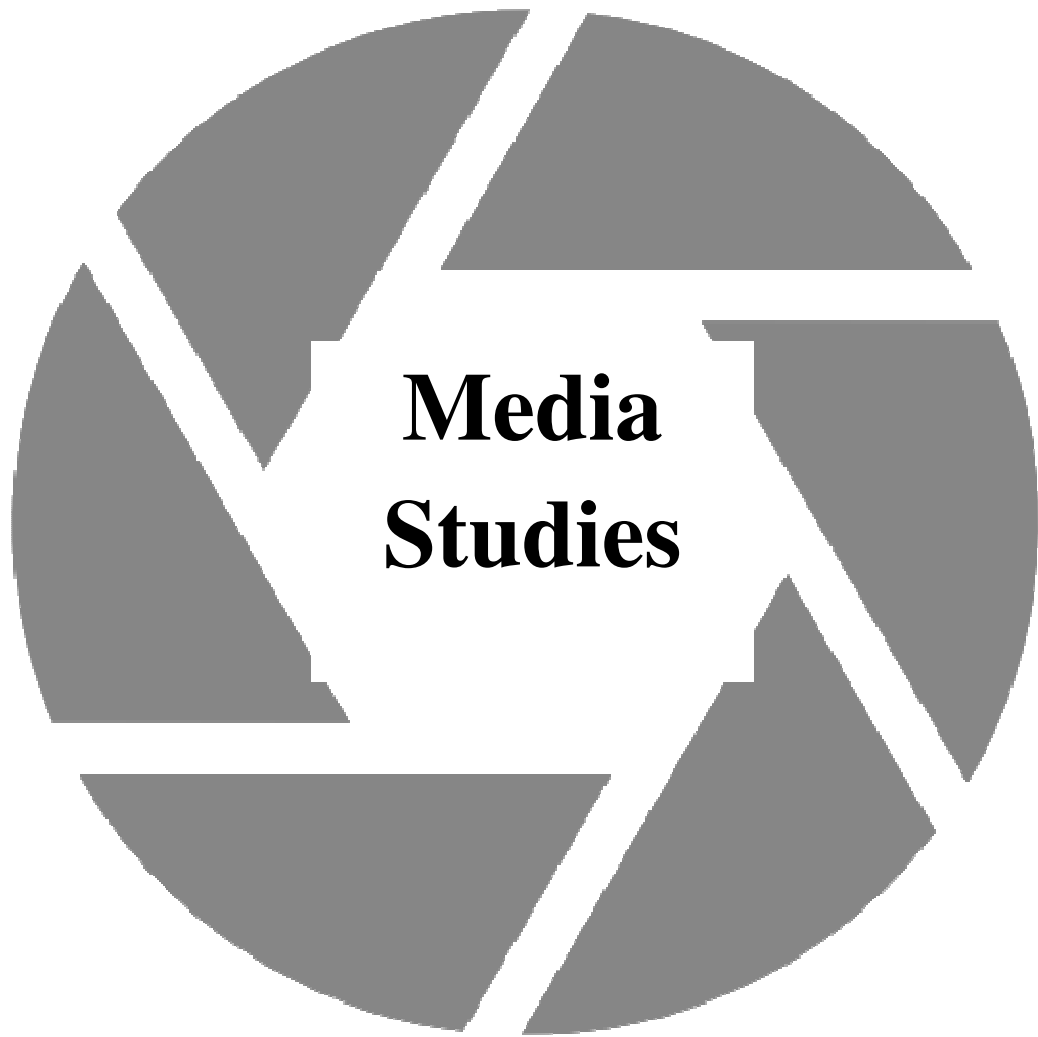
Psychoanalysis and mental health

Santanu Biswas

Department of English, Jadavpur University

Date & Time: 26th August, 2019; 2:15 PM - 5:15 PM

The lecture has two aims. In the first place, the lecture will introduce the candidates to the 3 broad approaches to the treatment of mental illnesses, in the form of Psychiatry, Clinical Psychology, and Psychoanalysis, and highlight the differences between them in terms of the differences in approaches, presuppositions, and methods of diagnosis and treatment. The second aim of the lecture is to introduce the candidates to psychoanalysis and to mental health problems relating to what Freud called "the unconscious." In order to be exhaustive, the lecture will incorporate both the 'unconscious of desire' and the 'unconscious of the drives'. I will extensively refer to Freud's clinical and theoretical writings, as well as to my own experience of practicing psychoanalysis in India, for illustrations. I will also try to make the lecture interactive and address specific queries of the candidates both during and at the end of it. If the technology available permits it, I will show some clips, and if necessary, a documentary film on the treatment of Schizophrenia.



**Media
Studies**

Documentary Film and Painting: The Crisis of Representation

Sanjoy Mukhopadhyay

Retired Professor, Department of Film Studies, Jadavpur University

Date & Time: 27th August, 2019; 2:15 PM - 5:15 PM

“I am not a painter, but a filmmaker who paints”

Michelangelo Antonioni

Today, the scopic regimes of modernity in which we live, demand that even an original work of art should be reproducible preferably by moving images. But is it at all possible/ desirable to ‘document’ a painting using the medium of film? This seems to me a very intriguing question because we, more often than not, encounter cinematic adaptations of painting. Notwithstanding their relative success or failure I remain in doubt whether painting can be located as a pro-filmic piece of art although I never question the usefulness of filming a particular piece of painting or sculpture. These reproductions can serve as historical evidences. At the same time I do remember that North European traditions are often considered to be more pro-cinematic than say Renaissance painting.

In any case I may give you an example, a very famous one in the history of cinema when Alain Resnais made a short film on Van Gogh or we can also refer to his more famous work on Picasso’s Guernica. Despite the fact that the films were made by very competent artists like Resnais people’s reaction were outrageous. They did not hesitate to call Resnais as immodest. Only at the intervention of Bazin, the great realist-theoretician Resnais was rescued. What was the fundamental reason of misunderstanding between the public and artist? I would submit that the functions of the frame in the cinematic images and paintings are different. The problem is when the French viewer believing that he was seeing the picture as painted was actually looking at through the instrumental form that profoundly changed its nature. Space as it is used in a painting is radically destroyed by the screen. One may ask -why? The answer is simple. Basically the frame of a painting encloses a space. In direct contrast to natural space the space in which is experience occurs, a painter opts for a space the representation of which is inward.

Whereas the outer edges of the screen are not the frames of the film image. They are the edges of a piece of masking that reveals only partial reality. A frame is centripetal. The screen is centrifugal. In a frame you see everything converging

where as in screen there is clear divergence or outward movement. That is why the basic sense of movement in Guernica is lost in its film version. We have no reason to condemn Resnais. For the moment if we turn our attention to another great filmmaker Akira Kurosawa we would be compelled to see that in one of the segments of his

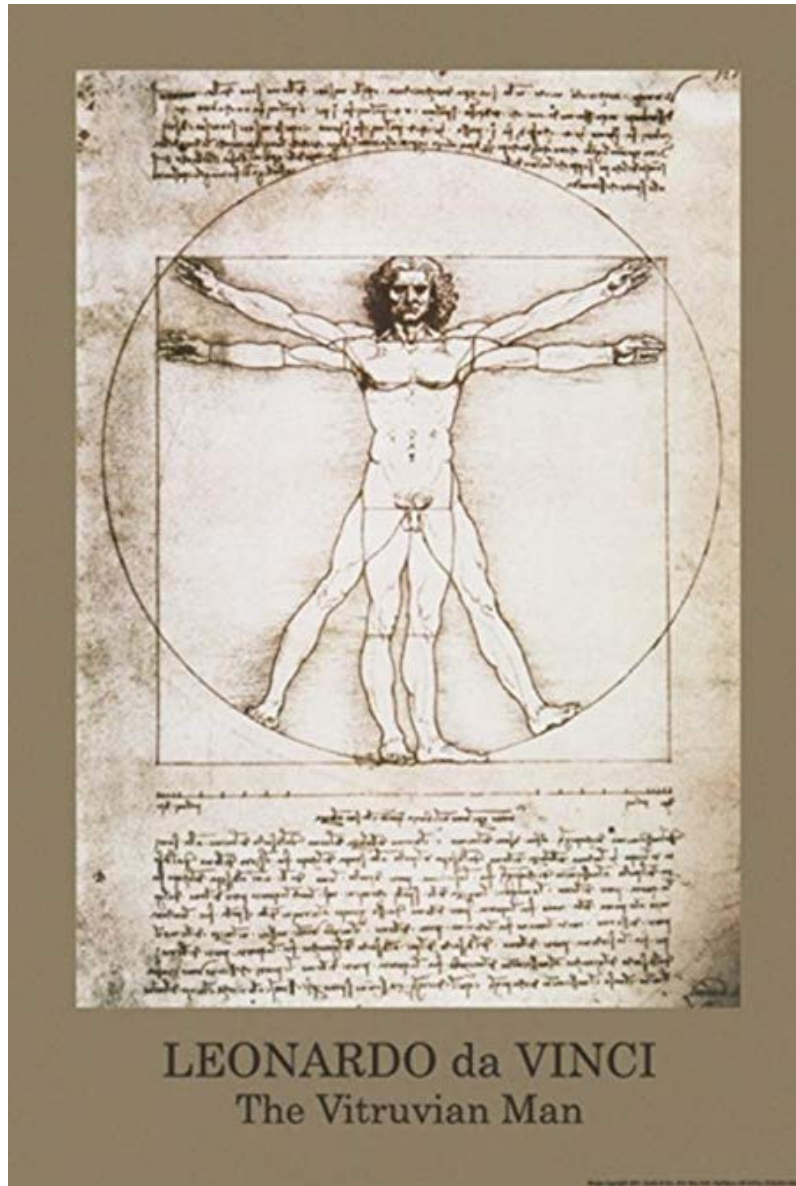
unforgettable Dreams he, compared to Resnais, became more successful with Van Gogh because in that particular segment he could inform us on the differences of painting and film. He compared and contrasted both media in a superb way. Kurosawa was a student of painting and that is why his tributes to Van Gogh became so moving.

In fact Van Gogh often acts as a darling to filmmakers only because his representational mode. A careful investigation of the Dutch painter's works would expose that his revolution laying the fact that he like a true iconoclast forced painting to come in close liaison with music. His violent lines convincingly cross the boundaries of frame. They go outward. Instead of converging they diverge. That was one among the reasons for which Kurosawa attempted to pay tribute to Van Gogh's concept of motion appears to be so meaningful. Even if the moving camera sits on a motionless space, the film is still moving and we are still watching, expecting and representing our eyes and spirit in motion. Movies that end with fade outs on continuing action or freeze frames show how endlessness is at the core of the medium – no tableau can be a true stop to visual flow or to the flow of temporality. Let us again consider the case of the Inner Eye – the Satyajit Ray master piece on the artist Binod Behari Mukherjee who was Ray's teacher during his Shantiniketan days. To my mind the Inner Eye is a brilliant documentary not because Satyajit submitted a chronological account of Binod Behari Mukherjee's development and his unfortunate blindness in later years but owing to Satyajit's ability to decode a kind of untold motion in Binod Behari's murals. Satyajit made a horizontal journey through the murals but never lost his basic point that his tasks envisage a responsibility to translate Binod Babu's form into an apparently foreign term. One of the most striking points in the film is the depiction of Dasaswamedh Ghat at Varanasi respectively by Binod Behari and Satyajit. Not only these two contradictory representations shake hands but also enter into a conversation on the nature of visual culture itself. Inner Eye therefore is more successful as a task and comment on the limitation of translation rather than illumination of an artist in totality. The same thing is also true for Ritwik Ghatak's unfinished project on Ramkinkar. The rushes would reveal that Ghatak refused to stay within the domain of neutrality. On the other hand the subjective camera discovers Ramkinkar's greatness from the most unusual angles. We can conveniently refer to the pieces of sculpture on Tagore and Buddhadev. It is impossible to miss that Tagore's long hair has been cut by Ramkinkar and Ritwik very consciously tried to handle these subtle moments as observations on the late age agony of a creative artist. In Lord Buddha the sweating in the form of water droplets in the screen of the saintly Buddha has been emphasized by Ramkinkar and Ritwik like a true admirer recorded it on the screen to preserve the austerity in his camera. Ultimately what Ritwik does is a kind of magic he comes closer and closer to Ramkinkar thus proving Ramkinkar as a work of sculpture in himself.

When I say film and painting are different media, I actually underscore the point that every great art form live within its own enclave and it has its own autonomy. It may

be communicated to us to an extent but whenever you try to translate something gets lost in translation. Jean Luc Goddard in his 1982 film *Passion* showed us a series of classical paintings - most undoubtedly among them was *Nightwatch* Rembrandt. At one point of time he cried out in despair that even the best studio in Europe could not fix the lighting pattern which was rare in the original canvas. One can at best try to have a very weak copy but the copies cannot reach the heights of original Leonardo, Goya and Delacroix.

This is the mystery where we usually get stuck and that inspired me to talk and listen to the debate around painting and film in India and abroad. Let us then proceed to the abstract space where still point of motion can be located.



History and Philosophy of Science

Philosophical View of Science: A Brief Understanding

Pradip Kumar Ghosh

Pro Vice Chancellor, Jadavpur University

Date & Time: 3rd September, 2019; 10:30 AM – 12:00 Noon

In general idea we know that Physics, Chemistry and Biology constitute science with Mathematics. In literature science viewed as: “Systematized knowledge covering general truths or the operation of general laws, esp. as obtained and tested through scientific method.” One of the key problems in Philosophy of science is to understand how techniques such as experimentation, observation and theory construction have enabled scientists to unravel so many of nature’s secret. The study of the most general and abstract features of the world and the categories with which we think. In philosophy the concepts with which we approach the world themselves become the topic of enquiry.

Though History of science usually not embedded in the curriculum and while science is taught rather in a historical way, it is argued that close attention to the history of science is indispensable for doing good philosophy of science.

It may be recalled that rapid scientific development occurred in Europe between the years 1500 and 1750. There were scientific investigations in ancient and medieval times- The dominant world was Aristotelianism. According to him all earthly bodies composed of just four elements: earth, fire, air & water.

Ptolemy’s earth centric model of universe was uprooted by Copernican model of Sun centric universe. In fact the whole system of mechanics, explanation of fall of apple and planetary motion was finally solved through Newton’s law of gravity. In leading to the conclusion we saw how the collection of data based on observation by Tycho Brahe and predicting the formula of planetary motion by Kepler helped the discovery of most natural force exist in Universe- “The force of Gravity”.

The scientific views established on Newton’s deterministic science upto late part of nineteenth century saw development science through number of discoveries and theoretical explanation. Concept of Atom by Dalton advanced many ways the physical science which we generally termed as Physics and Chemistry while “Theory of Evolution” by Darwin gives a better understanding of living being.

The entire scenario of science changed dramatically after discovery of Electron by Sir J.J. Thomson and quick theoretical advance in developing atomic structure and introduction of Quantum Mechanics on one hand and introduction of theory of relativity by Albert Einstein on another hand. Their emergence caused considerable conceptual upheaval not only in physics but in other branches of science. Finally yet incomplete revolution in biology took place in 1953 by Watson & Crick through the discovery of the structure of DNA. It leads to development of molecular biology, Understanding of Heredity & process of building organisms.

Scientific theories established through imagination, observation & experimentation. Both observation & experimentation on a system cannot be done infinite times. Then,

how we can say that it still become effective in next experiment or observation. Here lies the question why?

Twentieth century Philosopher Karl Popper's Theory of Falsification, Lakatos' observation and Hempel's covering model are discussed to know how science and philosophy are embedded. How deductive inference and inductive inference plays role in understanding the philosophical aspect of science and its theory is looked through Hume:

- Use of induction cannot be rationally justified.
- Whenever we make inductive inferences the presupposition is "Uniformity of nature".

Causality, conflict between Realist and Anti Realist are also discussed.

Finally we discuss how Thomas Khun arrived at paradigm concept. According to him a paradigm, therefore, determines not only a set of beliefs about the world. It also defines what counts as good science, and even determines what counts as a scientific fact. It is a conceptual framework that determines how the world looks to those who have accepted it. It defines not only the scientific outlook for practitioners of a particular science, but also the scientific "form of life."

In the conclusion it may be referred that in this lecture we have discussed about Induction, Explanation, Realism and Scientific change which are within the purview of General Philosophy of Science. There are scopes of issue based philosophical questions specific particular sciences. Conflict in physical science, Biological Science and human mind are dealt with examples.

Finally a short review of criticism on overdose of "Scientism" and idealistic difference between Science and Religion is made.

History of Development of Modern Differential Geometry

Manjusha Majumdar (Tarafdar)

Department of Pure Mathematics, University of Calcutta, Kolkata

Date & Time: 4th September, 2019; 10:30 AM - 1:30 PM

The History of Geometry may be roughly divided into four periods. Euclid wrote a book, named ELEMENTS about 300 B.C. There was a lack of perfection in the definition of “point” and “line”. Mathematicians were not willing to accept V as an axiom, as stated by Euclid. For 2000 years, they tried to prove it. Their failure, led to the invention of NON-EUCLIDEAN GEOMETRY. In the early part of 17th Century, a new approach of geometry was developed by the famous French mathematician Rene Descartes. It is due to him that such type of geometry is called CARTESIAN GEOMETRY. DIFFERENTIAL GEOMETRY is (loosely speaking) the study of Geometry with the help of Calculus. Modern Differential Geometry requires the knowledge of TOPOLOGY. The concept of a manifold generalises the concept of a curve or a surface in \mathbb{R}^3 .

Evolution of Scientific Ideas from Aristotle to Newton

Bichitra Kumar Guha

Indian Institute of Engineering Science and Technology, Shibpur, Howrah

Date & Time: 28th August, 2019; 10:30 AM – 1:30 PM

Search for truth about the Universe surrounding us started from ancient times. A number of philosophers in ancient Greece contributed in development of ideas about the earth and the heavens; notable among them was Aristotle who proposed different laws to work for the earth and the heavens and tried to establish logically the workings of terrestrial and celestial mechanics. His ideas may also be compared with those of ancient Indian philosophers. Later on, as the Catholic Church gained power, Aristotle's ideas were declared to be infallible and any contradiction was supposed to be anti Bible. From the time of the Renaissance, systematic scientific ideas started developing through Copernicus, Bruno and Galileo. After a long drawn struggle, finally through Newton, the modern science took shape. The ideas of these great thinkers have been discussed in details following chronologically the development of scientific ideas.



Science and Engineering

Deep marine resources of present-day oceans: its exploration and analyses

Subir Mukhopadhyay

Department. of Geological Sciences, Jadavpur University

Date & Time: 27th August, 2019; 10:30 AM – 12:00 Noon

During last few decades, oceanographic research opened new avenues for understanding the dynamic processes that are now active on our planet. The results of such studies also provide us an insight in tracing the environments and processes that shaped much of the ancient geological record. In this context, paralleling the leap in conceptualizing the plate tectonic model, metallogenic concepts received a tremendous thrust through assessment of direct relationships between processes and products obtained from actualistic examples. The subject of marine metallogenesis has grown vast indeed and present discussion will be confined to only some aspects of maximum impact in terms of understanding the ore-forming processes.

Study of ore-forming processes , active at present oceans, proto-oceans and seas, has substantially broadened the perspectives of the concepts of ore-genesis as well as other disciplines. Hydrothermal activities in the divergent and convergent plate boundaries today provide new insight to the genesis of different types of ores present even in ancient geological deposits and assist deposit modeling. Proliferation of chemosynthetic bacteria at deep-sea vent-site in an ecosystem depending on geotherms instead of solar-energy may have some say even on archaeobacteria generation and may prompt on the hypothesis of the origin of life related to hydrothermal system.

Efficient use of LPG Cook-stoves in Domestic Households

Amitava Datta

Department of Power Engineering, Jadavpur University, Kolkata

Date & Time: 28th August, 2019; 2:15 PM - 3:45 PM

Liquid Petroleum Gas (LPG) is the most widely used fuel in Indian urban households for the purpose of cooking. It is favoured widely because of its safe, less polluting and easy to use option. Presently, Govt. of India has taken up an initiative to extend the LPG supply in rural households and to families who live below the poverty line, using the Pradhan Mantri Ujjwala Yojana. LPG is primarily a blend of propane and butane gases and is obtained either from the gas fields or more commonly during crude oil refining. Due to the limited reserve of fossil fuel in general and crude oil in particular it should be a concern to utilize this fuel in an efficient manner for the sake of sustainability. Moreover, efficient use of LPG helps the consumer to spend less over fuel in their monthly bill. Therefore, it should be the duty of every household to utilize LPG gas the most efficiently.

In a LPG cook-stove, the fuel gas burns in air producing a flame at the burner. The heat released in combustion is then transferred to the load, which is placed upon the burner. The overall efficiency of the cook-stove can be expressed as the product of the combustion efficiency and the heat transfer efficiency.

LPG burns in the stove as a partially premixed flame with the burner configuration similar to the commonly used Bunsen burner. The ingress of primary air and the premixing of it with the fuel inside the burner affect the combustion efficiency. A good amount of primary air helps to complete the burning in the premixed flame front. However, as the primary mixture gets richer, the burning at the premixed flame becomes incomplete thus generating incomplete products of combustion. The incompletely burnt species complete their oxidation in a non-premixed flame with the air from the surrounding atmosphere. Non-premixed flames can be more sooty resulting radiative loss from the flame. Soot also has adverse effects when deposited on burners and utensils.

Heat transfer efficiency can be improved as the heat loss in the hot gas is reduced. This depends on the height of the load from the burner top, relative dimension of the load to the burner, flow rate of LPG etc. A clear knowledge of the impact of all factors can help in optimizing the performance of the cook-stove.

Safety in usage is another important aspect on which the consumers should have a clear idea. The use of good quality hose, proper regulator and clean burner ensure safety in operation. The cylinder pressure should be properly maintained during filling and any leakage of gas should be immediately brought into the notice of the authority.

Bio Science and Biotechnology

Introduction to Design Ergonomics

Somnath Gangopadhyay

Occupational Ergonomics Laboratory

Department of Physiology, University of Calcutta, Kolkata

Date & Time: 30th August, 2019; 10:30 AM - 1:30 PM

Ergonomics can be defined as “Science, Technology & Art of Man at Work”. The subject is related with the definite aim on the enhancement of human performance. In other word, application of ergonomics is “the improvement of individual and group productivity”.

The subject seeks to change the things to better match capabilities, limitations & needs of people.

Ergonomics is the application of the human biological sciences in conjunction with the engineering sciences to the worker and his working environment, to obtain maximum satisfaction of the worker which at the same time enhances productivity

On the basis of its application it can be divided in three categories: Physical, Organizational and Cognitive ergonomics.

Cognitive ergonomics is the subfield of cognitive science. It concerns with the human task oriented activities and deals with processing and decoding of information and finally plays a definite role in understanding. It has a direct contribution in the design of product. Through this way, ergo design term has recently been coined.

By application of cognitive science, ergonomics and anthropometry, product is now becoming more easy to use with maximum comfort. Simplification in gadgets and proper application of anthropometry in it makes the tools more user-friendly.

Nanomedicine for Biomedical Applications: Opportunities and Challenges

Chittaranjan Patra

Principal Scientist, Department of Applied Biology

Associate Professor of Biological Sciences in Academy of CSIR-IICT

Date & Time: 4th September, 2019; 2:15 PM - 5:15 PM

Nanoscience and nanotechnology is an interdisciplinary field science involving chemistry, physics, engineering, electronic, biology, medicine, pharmacy etc. Now-a-days, nanotechnology has been extensively used for agriculture, electronics, lubricant, textile, space, medicine and biology. In biology and medicine, nanotechnology has been extensively used for various biomedical applications including drug/gene delivery, bio-imaging, sensing for the treatment and detection of various diseases (cancers, cardiovascular diseases, diabetic etc.). Traditional therapies for the treatment of these diseases comprise surgery, chemotherapy and radiation therapy. However, these strategies have several limitations including damaging of healthy cells, non-specificity, toxicity of anticancer drugs, poor bioavailability, fast clearance and restrictions in case of metastasis. In this context, nanotechnology can make a significant role. Very recently, nanotechnology dealing with metal-based nanomaterials is widely applied in almost every field of science and technology including biomedical applications due their unique fundamental properties (e.g. physical, chemical, biological, optical, electronic etc.). My talk will mainly focus on nanotechnology, nanomedicine, various types of nanoparticles, application of nanoparticles for drug delivery for the theranostics applications of various diseases.

Our group at IICT is currently pursuing various nanomedicine research projects aimed at developing advanced nanomaterials and nanoparticles-based drug delivery systems (DDS) for treatment of cancers and angiogenesis study for the treatment of cardiovascular diseases, ischemic disease and wound healing where angiogenesis plays an important role. I will also briefly discuss about our ongoing research at IICT.



Medical Science

Food and Cancer

Dr. Sankar Kumar Nath

Senior Oncologist, Ex. Deptt. of Oncology, R.G.Kar Medical College and Hospital, Calcutta.

Date & Time: 2nd September, 2019; 10:30 AM - 1:30 PM

Cancer is such a group of diseases, which people fear most. They associate cancer with death. But the fact is different, no doubt. In fact we can control or arrest or sometimes cure Cancers today with the help of all modern medicines and technology.

Simultaneously we must think the old proverb “Prevention is better than cure” which is applicable to cancer also.

Now we know that 70-75% of cancers are preventable according to WHO. The following cancers can be prevented –

- 1) Occupational Cancer.
- 2) Radiation induced Cancer.
- 3) Hormones and Cancer.
- 4) Tobacco and cancer.
- 5) Exercise and Cancer.
- 6) Diet (food) and Cancer and so on.

We shall discuss here in short on Food and Cancer.

What is cancer :

Cancer is a disease in which a family of cells will grow progressively with permanent impairment of normal growth control, resulting in spread of the primary group of tumour cells.

Character of cancer cells :

Cancer cells are very much different from the normal cells. They do not remain confined to primary part only. Rather they infiltrate into the adjoining part of the body. Usually some of the cancer cells from the original site may be detached and travel to the distant sites of the body through blood streams, lymphatic channels or other methods. This is called metastasis. This is how the cancer kills the patients quickly.

Carcinogens :

These are such substances that can initiate neoplasia (both benign and malignant).

FOOD AND CANCER (Cancer Prevention through Foods)

- 1) Diet causing cancers.
- 2) Diet preventing cancers: 30 – 40% of cancers can be prevented by diet.

1) Diet causing cancer:

A) Fat :

Several studies have shown that there is strong association between consumption of dietary fat and formation of cancers in the breast, the prostate, colon, rectum endometrium and ovary.

B) Fast food :

Children today very much like to take fast food and begin to take from early ages. Fast foods are rich in fat, high sodium, low fiber, low calcium content and also deficient in essentially nutrient. This is why fast food leads to develop cancer.

C) Preservatives and Additive :

Some substances of nitrate are used as preservatives of food stuff specially meal. Nitrate is transformed into nitrite and in stomach it is transformed into Nitrosamine which is a form of potent carcinogen.

Sometimes we see a fungus called *Aspergillus flavus* that grows mainly on peanut plants and dry fruits. This fungus contains a carcinogen known as Aflatoxin which can cause liver cancer.

Gyromitra esculenta, a type of mushroom used in cooking, contains N – methyl – N formyl – hydrazine which is a strong carcinogen.

Additive like metanil yellow, Iron oxides, lead bromate are usually mixed in '*Ghoogni*', '*Bonday sweets*', leads to the formation of Cancer stomach, Cancer colon etc.

Tremendous use of pesticides like DDT, Aldrin, Carbon tetrachloride, formaldehyde, Vinyl chlorides is threatening for development of different cancers like Leukemia, Lymphoma, brain cancer, skin cancer etc.

Taking salt cured foods regularly may cause stomach cancer. This is probably the reason why Japanese suffer most in cancer of stomach. This may also give rise to Esophageal cancer.

Radioactive substances contaminated foods are threat to the formation of cancer lung, cancer bone etc.

D) Smoked food:

Smoked foods (meat, fish etc) may be delicious but because of the smoking process, cancer-causing substances are deposited on the surface of the food. Regular consumption of smoked food may give rise to cancer stomach and others.

E) Drinks:

a) Alcohol: Excessive alcohol consumption is a risk factor for cancers of the oral cavity, pharynx, larynx, esophagus, pancreas and liver.

Women who consume alcohol have a greater risk of developing cancer breast than the non-drinkers.

b) Coffee: Excessive coffee drinking may be related to cancer of lower Urinary tract including Urinary bladder.

c) Water: Excessive chlorination in drinking water may be associated with Gastrointestinal cancer and urinary bladder cancer. Regular taking of such water, contaminated with arsenic, asbestos particles and other organic compounds, may lead to formation of cancer lung, cancer Gall bladder and skin cancer.

d) Too hot or too cold drinks – if taken regularly may lead to cancer esophagus.

2) Diet preventing cancer:

There are lot of foods that are considered as anti-cancer agents at various degree. The types of food, you eat are really important. You are to keep these cancer preventing foods in your daily dish. These are as follows:

A) Vitamin C:

Citrus fruits, tomatoes, berries, green vegetable, potatoes, guava, cucumbers. Daily need 30 – 50 mg.

B) Vitamin A:

Tomato, milk, eggs, liver, kidney, leafy green vegetable, yellow vegetable, carrot, ripe mango, 'lal notey sak', radices, Daily need: 5000 IU

C) Vitamin E:

Leafy vegetable, vegetable oils, whole grain cereals, mother's milk.
Daily need : 15 mg

D) Minerals :

Selenium : Liver. Sea fish, Rice, Wheat
Calcium : Protects from Colon cancer.
Other minerals : Magnesium, Iron, Copper, Zinc etc.

E) Other foods :

Cabbage, Cauliflower, Sweet potato, Bean, Grape, Banana, Turmeric, Garlic, Legume, Pumpkin, etc.

F) Dietary Fiber :

Dietary fiber is very much protective against cancer. Daily need is 25 – 30 gm. But Americans typically consume 3 to 5 gm per day only.

High dietary fiber protects against colon cancer, rectal cancer, breast cancer. Bantu tribe of South Africa take lot of fibers from their daily foods ---- 200 to 250 gm approximately per day. Incidentally colon cancer, rectal cancer, breast cancer, cancer prostate are very rare amongst the Bantu people. Fruits, Vegetables, Wheat etc. are all rich in fibers.

G) Vitamin C is a strong anticancer agent. So do take Vitamin C as per daily need. Vegetables high in Vitamin C , like Potato, Broccoli, Cabbage, Spinach etc. should be cooked briefly and where possible, whole and in covered dishes. If you squeeze the juice from the Orange, you will reduce the Vitamin C to a greater extent , because it is reduced by the oxygen in the air. Luckily for us, most of the foods that are rich in Vitamin C e.g. Citrus fruits, Strawberries, Melons etc. do not need cooking.

H) Do's and Don'ts in preparing foods :

1. Don't drown your foods :

You will retain more Vitamin C and other Vitamins when vegetables are cooked without added water. More water you use fewer Vitamins you retain.

2. Do keep foods in one piece :

The more you cut the cells, the more you expose Them to air or water and more nutrients are lost. Whole Sweet potato retains 89% of Vitamin C, but cut in half, it keeps only 31%.

3. Don't allow sliced food to stand :

Cucumber loses at least 25% of Vitamin C when they are sliced, and they lose 30%, when slices are left standing for an hour. After 3 hours almost 50% of Vitamin C are vanished.

4. Do use all parts of the plants :

Broccolis have more Vitamin A in their leaves, stalks and flower buds than stem.

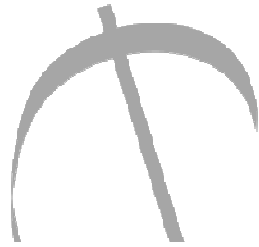
5. Do save cooking liquids

I) REMEMBER 7 CANCER WARNING SIGNALS :

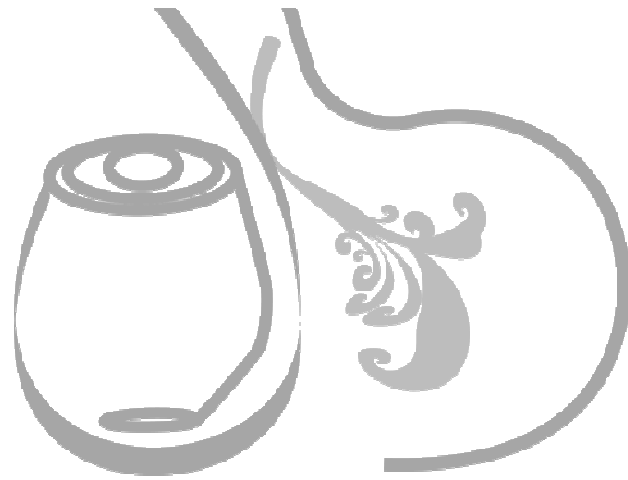
1. A LUMP OR THICKENING IN BREAST.
2. A CHANGE IN A WART OR MOLE .
3. A SORE THAT DOES NOT HEAL.
4. A CHANGE IN BOWEL HABITS.
5. A PERSISTENT COUGH OR HOARSENESS OF VOICE.
6. CONSTANT INDIGESTION OR TROUBLE SWALLOWING.
7. UNUSUAL BLEEDING OR DISCHARGE.

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3. The Prevention of Cancer Ed by M. Alderson, 1982.
4. The Complete Book of Cancer Prevention Ed by Carol Keough, 1993.
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Performing Arts



Srekhol

Harekrishna Halder

Srekhol Artist

Date & Time: 14th September, 2019; 2:15 PM – 5:15 PM

The instrument Sreekhol is indigenous instrument of India. In Bengal, Manipur, Orissa it is widespread. Its origin is from Midangam (Sans. *Mrit* = Clay and *Anga* = Body). It means the instrument with clay body. During the period of Sree Chaitanyadeva Sreekhol got its overwhelming outflow throughout Bengal. The lecture intends to focus on the fundamental aspects of origin and evolution of Sreekhol and its present status. It tried to exhibit the different *Talas*, *Matras* and *Chalans* use in this instrument. The demonstration tried to show the use of this in Keertan.

The UGC-HRDC Team

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