



QUALITY IMPROVEMENT ROADMAP

*Faculty of Physical Sciences,
SGT University*

OUTGOING YEAR (2016-2017) SYLLABUS, CURRICULUM, QUALITY IMPROVEMENT

Planned for the following in outgoing academic year

- Theory-Practical Marks Balance (almost 50:50)
- Introduction of M.Sc. Nanoscience and Technology
- Introduction of M.Sc. Applied Mathematics
- Introduction of Paper "Calculus Without Limits" for Academic Year 2017-2018 for B.Sc.(NM) 1st Sem
- Introduction of Paper "History and Philosophy of Science" for Academic Year 2017-2018 for B.Sc.(NM) 1st Sem
- Ph.D. programmes - Pre-Ph.D curriculum
- Preparation Ph.D. Entrance Question Papers for Physics, Chemistry & Mathematics for Academic Year 2017-2018



CURRENT ACADEMIC YEAR (2017-2018) QUALITY ROADMAP

CURRENT ACADEMIC YEAR (2017-2018) SYLLABUS, CURRICULUM, QUALITY INITIATIVES

Actually implemented

- Theory-Practical Marks Balance (almost 50:50)
- Introduction of M.Sc. Nanoscience and Technology (No admission yet)
- Introduction of M.Sc. Applied Mathematics
- Introduction of Paper "Calculus Without Limits" for Academic Year 2017-2018 for B.Sc.(NM) 1st Sem
- Introduction of Paper "History and Philosophy of Science" for Academic Year 2017-2018 for B.Sc.(NM) 1st Sem
- Ph.D. programmes - Pre-Ph.D curriculum
- Ph.D. Entrance Question Papers for Physics, Chemistry & Mathematics for Academic Year 2017-2018

INTERNALLY ARRANGED FDP TALKS/ WORKSHOPS & 1-ON-1 DEVELOPMENT TALK

Workshop on how to make Teaching interesting	Dr Amal K Saha
Silicon Semiconductors	Dr C M Singal
Basic Concepts of Laser Physics	Dr R C Sharma
Curriculum Development and Assessment - Cognitive Levels	Dr Sonali Bhandari
Overview of IPR	Dr Ajay Kumar
Leadership Style - Delegation vs Instruction (Direction) vs Encouragement vs Nurturing	Dr Amal K Saha

DEMO LECTURES BY FACULTY MEMBERS - TRAIN THE TRAINERS

- Objectives
 - Use of technology in teaching delivery
 - Preparation of assignment with high cognitive levels
 - Connecting with fundamentals
 - Validation of non-didactic teaching paradigm
 - Connecting with students
 - Step in the direction of formative assignment

OTHER QUALITY INITIATIVES

- encouraging **english as lingua franca**
- delivery of 3-week **Bridge Course** in Physics, Chemistry & Mathematics to FPS & FET students
- **Expert/Guest** Lectures being planned
- **Educational visits (Excursions) & Industry Connections** are being planned
- Exploring **summer/winter school participation by students** in Physics, Chemistry, Mathematics, subject to pre-selection of the organizers
- **proposal submitted to Dean of Research for subscriptions to journals which FPS needs for research**
- **sample question papers already prepared as per latest IQAC guidelines and approved**
- **University-wide FDP Workshop conducted by FPS Faculty Member, Dr Sonali Bhandari** : 'Pedagogic and Personal Effectiveness Workshop', SGT University, Gurgaon, 10th-12th January, 2017

COGNITIVE SKILLS SELECTED BY FPS FOR ADOPTION

- FIVE teaching methods (cognitive skills) selected in this academic year:
 - A. problem based learning (e.g., home assignment)
 - B. simulation (animation, demo, model display, class in lab, Monte Carlo)
 - C. spot group discussion
 - D. project based learning (e.g., Technofest)
 - E. Student's Seminar (e.g., senior student taking class for juniors)

BOARD OF STUDIES FOR ADOPTING NEW CHANGES

- adoption of 40% formative assessment by FPS;
60% summative assessment
- adoption of new scheme of examinations &
question paper guidelines
- introduction of MATLAB in Mathematics Practical

OWNERSHIP & EXCELLENCE IN EXECUTION

EVERYTHING WOULD FAIL IF THERE IS NO COMMITMENT FOR

- **OWNERSHIP**
- **EXCELLENCE IN EXECUTION**

ARE THESE THINGS IRRELEVANT IN ACADEMIC ENVIRONMENT AND ARE CORPORATE PRACTICES ONLY?

OTHER THINGS POSSIBLE, BUT NOT PLANNED NOW

- arranging special classes for job interview (free)
- arranging special coaching for NET



RESEARCH

RECENT RESEARCH PUBLICATIONS

- **Sonali Bhandari**, The Evolution of Environment Education in India, International Journal of Humanities and Social Science, 2016, 3(1).
- **Bhandari S.** (Poster Presented in 2016): 'The Wetlands of the Lands of the Gods-Their Enthralling Beauty and Potential Geohazards', National Symposium on Recent Advances in Remote Sensing and GIS with special emphasis on mountain ecosystems & Annual Conventions of Indian Society of Remote Sensing and Indian Society of Geomatics, Indian Institute of Remote Sensing, Dehradun, India. Faculty Development Program on
- **Mishra, D.** and Shukla, A. (2017). Air Quality due to Day wise Odd-Even Vehicle Movement in Delhi, India. International Journal of Earth and Atmospheric Science, 3(4),73-81.
- **Sunanda Sharda** (Conference Paper in 2016): A Study of Thermal Stability & Crystallization Kinetics of SbSeGe Glassy Alloys
- **Sanjeev Chauhan**(Phys. Rev. E 96, 012305, 2017); Discrete-time dynamic network model for the spread of susceptible-infective-recovered diseases.
- **Ajay Kumar:** Superconductivity of Fullerenes: A Review, Research Journal of Pharmaceutical, Biological and Chemical Sciences, May-June, 2017, pages 1045
- **Ajay Kumar:** Non-Isolated Pentagon Rule Fullerenes: A Review, Research Journal of Pharmaceutical, Biological and Chemical Sciences , May-June, 2017, pages 1036
- **Ajay Kumar,** Intrinsically Bent DNA : Structure and Models , Research Journal of Pharmaceuticals,Biology andChemical Science, 8(3) 2017.
- **Ajay Kumar,** Unusual DNA Structures , Research Journal of Pharmaceuticals,Biology andChemical Science, 8(3) 2017.
- **Pooja Rana:** A paper entitled, "*A Theoretical Study on Cerium- Nickel Intermetallic Compound*" has been presented during International Conference on Recent Chemical Sciences at Govt. Engineering College, Bikaner on 12-13 Jan 2017 and will be published in American Institute of Conference Proceedings.

RECENT RESEARCH PUBLICATIONS [CONTINUED]

R C Sharma's Publications since July 2016:

1. A Study of Estimation of Sea Level Variations using GNSS Technology and GPS Observation published in Journal of Agro ecology and Natural Resource Management (p-ISSN: 2394-0786), Vol. 3, Issue 2; July-September 2016, pp 200-205.
2. Influence of Oxides of Nitrogen, Carbon Monoxide & Sulphur Dioxide on Ozone Level in different Meteorological Seasons in Haryana State, Northern India, published in American Journal of Environmental Protection (ISSN: 2328-7233), Vol. 5, No. 1, 2017, pp 1-8 (Available online at <http://pubs.sciepub.com/env/5/1/1>) DOI:10.12691/env-5-1-1.

R C Sharma, Paper published in Proceedings of International Conference: Technical Advancement in Organic Solar Cells – a Critical Analysis published in “Innovative Approach in Applied Physical, Mathematical/ Statistical, Chemical Sciences and Emerging Energy Technology for Sustainable Development” pp 12-17, 2017 (ISBN: 978-93-85822-39-1)

R C Sharma, International Conference - presented Research Paper: International Conference on “Innovative Approach in Applied Physical, Mathematical/ Statistical, Chemical Sciences and Emerging Energy Technology for Sustainable Development” Jawaharlal Nehru University (JNU), New Delhi (January 15, 2017).

Haseeb Athar & **Zuber Akhter** (2016): Recurrence relations between moments of progressive type-II right censored order statistics from doubly truncated Weibull distribution. Statistical Papers, 57(2), 419-428.

MJS Khan, **Z Akhter**, N Wahid & S Kumar (2016): Characterisation of continuous probability distributions conditioned on a pair of record values. ProbStat. Forum, 9, 109-114.

CURRENT RESEARCH PROPOSALS FOR FUNDING - SUBMISSION IN JULY 2017

- **Dr Dhirendra Mishra and Dr R C Sharma (DST, July 2017):** Evaluation and Mitigation of Health Effects using personal atmospheric pollution exposure monitoring and modelling.
- **Dr Anjali Gupta (DST, July 2017):** Synthesis, characterization and application of organobismuth Compounds.

CURRENT RESEARCH PROPOSALS FOR FUNDING - SUBMISSION IN AUG-SEPT 2017

- ▶ **Dr Amal K Saha & Dr Sonali Bhandari (RCN-DST, deadline September 2017):** Near-real-time and Historical Data Analytics of Car's On-board Data using a Combination of Fog and Cloud Computing Infrastructure, and Standard and Machine Learning and Algorithms for Regulators and Insurance Industry Participants.
- ▶ **Dr Amal K Saha & Dr Sonali Bhandari (RCN-DST, deadline September, 2017):** Specialized Service Delivery for elderly, disabled, illiterate and vulnerable citizens, using Natural Language Processing (NLP), Humanoid Agent and Conversational User Interface (CUI) based channels, and Combination of Machine Learning and Rule-based Algorithms.
- ▶ **Dr Pooja Rana, Dr C M Singal (DST, August/Sept 2017):** Hydrogen absorption in metal hydrides: Novel materials for new possibilities in Li-ion batteries
- ▶ **Dr Mukesh Kumar (DST, Aug/Sept):** Effect of Crystallographic texture on Shape Memory Properties of NiTi, NiTiCu and NiTiHf alloys.
- ▶ **Dr Sanjeev Chauhan (DST, August/Sept 2017):** Sintering Process (Coalescing into Solid or Porous Mass) in Nano-particles using Computational Methods.



NAAC INSPECTION - **FPS CONTRIBUTION**

CONTRIBUTION TO NAAC IQAC'S AQAR PREPARATION ACTIVITIES

- Dr Sunanda from FPS is nominated as a member of IQCA
- She is contributing to submission of **Part-B Criterion VII Innovations & Best Practices** of Annual Quality Assurance Report (AQAR) for annual NAAC Inspection

CHALLENGES TO RESEARCH ORIENTATION

- Faculty teaching and administrative loads are high - this is NOT ideal for research driven university
- Retention of research talents in high-admin & high-teaching load environment is a big challenge.
- 6-day work week is perhaps not ideal for research
- basic research infrastructures like scientific journal access, computational facilities, labs are yet to be functional in FPS
- no real rewards for value adding activities like research and innovation - risk/reward policy is awaited

APPENDIX

DEMO LECTURE

Faculty Member Name	Department	Lecture Topic (dur: 1 hr)	Evaluators (HoD, Dean & ?)	Scheduled Date
Dr. Dhiendra Mishra	Physics	Superconductivity	Prof C M Singal	18th July
Dr. Pooja Rana	Physics	Basics of Statistical Mechanics	Prof C M Singal	18th July
Dr. Sunanda	Physics	Nuclear Models - Liquid Drop Model and Nuclear Shell Model	Prof C M Singal	18th July
Ms Namita	Mathematics	Metric Space -	Prof C M Singal	18 July 2017
Dr. Zuber Akhter	Mathematics	Statistics: Hypothesis Testing	Prof C M Singal, Dr Sanjeev Chauhan	19th July
Dr. Mukesh	Physics	Special Theory of Relativity	Prof C M Singal	19th July
Ms. Minni Ruhil	Mathematics	Groups Homomorphism	Prof C M Singal	19 July 2017
Ms. Shivani	Mathematics	Partial Differential Equations	Prof C M Singal	20 July 2017
Mr. Naveen Kumar	Mathematics	Interpolation	Prof C M Singal	20 July, 2017
Ms Mamta Rani	Mathematics		Sandeep Mogha, Santosh Dixit	20 July, 2017
Dr. Anjali Gupta	Chemistry	Fundamentals of NMR	Prof Ajay Kumar, Prof C M Singal, Dr Sonali Bhandari	22 July
Dr Navin Sharma	Mathematics	?	Sandeep Mogha, R C Sharma, C M Singal	22 July
Mr. Anjaneyulu Bendi	Chemistry	Synthesis of C-(E)-cinnamoyl glycosylic compounds as precursors for new biologically active C- glycosides	Prof Ajay Kumar, Prof C M Singal, Dr Sonali Bhandari	22 July

LEADERSHIP STYLES - FDP

