

**Department of Physics and Materials Science**

**Dated: 23-11-2017**

The meeting of the Board of Studies of the Department of Physics and Materials Science was held at 11:00 AM on 23<sup>rd</sup> November 2017 at JUIT Board Room. The following members of the BOS, Physics and Materials Science were present in the meeting

**Members from Department**

Prof. P.B. Barman	HOD	Chairman
Prof. Sunil K. Khah		
Dr. Vineet Sharma		
Dr. Pankaj Sharma		
Dr. Dheeraj Sharma		
Dr. Rajesh Kumar		
Dr. Surajit Kumar Hazra		
Dr. Ragini R. Singh		
Dr. Sanjiv Kumar Tiwari		

*[Handwritten signatures and dates]*  
23/11/17  
- On leave -  
23/11/17  
23/11/2017  
23/11/2017  
23/11/17  
23/11/2017  
23/11/17  
23/11/17

**Members from other Departments of JUIT**

Prof. Karanjeet Singh	HOD, Mathematics	
Prof. Sunil Bhooshan	HOD, ECE	
Prof. S.P. Ghreera	HOD, CSE & IT	
Prof. Ashok K. Gupta	HOD, Civil	- on leave -
Dr. Sudhir Syal	Acting Head, BI & BT	23/11/17

**Member from Sister Institutes**

Prof. D.K. Rai HOD, Physics & Materials Science, JIIT, Sec.62, Noida

**Member from Other Institutes**

Prof. Anil Vohra Dean, Academic Affairs,  
Kurukshetra University, Kurukshetra, Haryana

(Professor, Dept. of Electronic Science,  
Kurukshetra University, Kurukshetra, Haryana)



**Department of Physics and Materials Science**

**Board of Studies Meeting of the Department of Physics and Materials Science on 23<sup>rd</sup> November 2017 at 11:00 AM to decide the agenda for the Academic Council Meeting to be held in December 2017**

**Agenda I:** Proposal to discuss introduction of M.Sc. Physics Course (Duration: 2-Years Programme Credits: 75), w.e.f. July 2018. [Annexure-I, Brief proposal and course outline].

**Agenda II:** Proposal to appoint Prof. (Dr.) Sukumar Basu as Emeritus/Honorary Professor in the Department of Physics & Materials Science, JUIT, Wajnaghat, H.P. [Annexure-II, Joint publications of Prof. Sukumar Basu with Prof. P.B. Barman & Dr. Surajit K. Hazra, Department of Physics & Materials Science, JUIT].



## M.Sc. Physics

**Duration: 04 Semesters**

**Programme Credits:75**

### Semester I (Credits: 17)

S. No.	Course Code	Course Name	L-T-P	Credit
I	18MS1PH111	Mathematical Physics	3-0-0	3
II	18MS1PH112	Classical Physics	3-0-0	3
III	184MS1PH113	Quantum Mechanics	3-0-0	3
IV	18MS1PH114	Electrodynamics	3-0-0	3
V	18MS1PH115	Nuclear Physics & Particle Physics	3-0-0	3
VI	18MS1PH116	Laboratory-I	0-0-4	2

### Semester II (Credits: 20)

S. No.	Course Code	Course Name	L-T-P	Credit
VII	18MS2PH211	Computational Physics	3-0-0	3
VIII	18MS2PH212	Statistical Physics	3-0-0	3
IX	18MS2PH213	Condensed Matter Physics-I	3-0-0	3
X	18MS2PH214	Atomic & Molecular Spectroscopy	3-0-0	3
XI	18MS2PH215	Electronics-I	3-0-0	3
XII	18MS2PH216	Laboratory-II	0-0-4	2
XIII	18MS2PH217	Programming in MATLAB	3-0-0	3

### Semester III (Credits: 19)

S. No.	Course Code	Course Name	L-T-P	Credit
XIV	18MS3PH311	Electronics-II	3-0-0	3
XV	18MS3PH312	Advanced Quantum Mechanics	3-0-0	3
XVI	18MS3PH313	Condensed Matter Physics-II	3-0-0	3
XVII	18MS3PH314	Computational Physics Laboratory	0-0-4	2
XVIII	18MS3PH315	Project Part-I	0-0-10	5
XIX	18MS3PH3xx	Elective-I	3-0-0	3

### Semester IV (Credits: 19)

S. No.	Course Code	Course Name	L-T-P	Credit
XX	18MS4PH11	Project Part-II	0-0-20	10
XXI	18MS4P4xx	Elective-II	3-0-0	3
XXII	18MS4PH4xx	Elective-III	3-0-0	3
XXIII	18MS4PH4xx	Elective-IV	3-0-0	3

### Evaluation Scheme:

Theory		Laboratory	
Test - I	15	Day to day work 60%: Break-up of Day to day work will be as follows: (i) Attendance 15% (ii) Quantity & Quality of Experiments including Performed, Learning laboratory Skills and handling Laboratory Equipment, Instruments, Gadgets, Components, Materials and Software etc. 30% (iii) Laboratory record 15%.	60
Test - II	25		
Test - III	35	Mid Term Test 20% (Viva + performance)	20
Teacher Assessment	25	End Term Test 20% (Viva + Performance)	20
<b>Total Marks</b>	<b>100</b>	<b>Total marks</b>	<b>100</b>



worked mainly on oxide semiconductors like ZnO and TiO<sub>2</sub> for gas sensor applications. At present he is working on growth and characterizations of the novel material, graphene for gas sensor applications. He has published around 250 scientific and technical papers in the reputed national and international journals. So far he has contributed 12 book chapters mostly published by the international publishers. Prof. Basu has edited a book "crystalline silicon-properties & uses" published by InTech publishers, a European publishing house. He has guided several Ph.D. theses in IIT Kharagpur and in Jadavpore University.

Prof. Basu attended a large number of national and international seminars and conferences throughout the world and delivered invited and contributed lectures on his area of research specializations. He is the editorial board member of a number of national and international journals on materials science and sensors. He is the regular reviewer of the journals, J. of Materials Science-Materials in Electronics, J. of Materials Science & Engineering B, Solid State Electronics, J. of Electronic Materials, IEEE Sensors, and Sensors & Actuators B: Chemical, Sensor Letters, Applied Surface Science, Journal of Electrochemical Society and ACS Journals on Chemical Sensors. Prof. Basu has quite a few novel and new ideas in the field of chemical gas sensors to contain the environmental pollutions, an alarming problem for human lives.

*Joint Publications:*

1. Sukumar Basu, Surajit Kumar Hazra, Graphene-Noble Metal Nano-Composites and Applications for Hydrogen Sensors, C 2017, 3(4), 29; doi:10.3390/c3040029.
2. D. Dutta, J. Das, S.K. Hazra, C.K. Sarkar, S. Basu, Influence of graphene growth temperature by chemical vapour deposition on the hydrogen response of palladium-graphene junction, J Mater Sci: Mater Electron, 28 (2017) 13217-13228, DOI 10.1007/s10854-017-715.
3. D. Dutta, J. Das, S.K. Hazra, S. Basu, Influence of Metal Contacts on Graphene Based Chemical Sensor Devices. Journal of Microelectronics and Solid State Devices. 3(3) (2016) 1-9p. (ISSN: 2455-3336)
4. D. Dutta, E. Bontempi, Y. You, S. Sinha, J. Das, S.K. Hazra, C.K. Sarkar, S. Basu, Surface topography and hydrogen sensor response of APCVD grown multilayer graphene thin films, J Mater Sci: Mater Electron, 28(1) (2016), 157-166; DOI 10.1007/s10854-016-5506-1.
5. Temperature- and Hydrogen-Gas-Dependent Reversible Inversion of n-/p-Type Conductivity in CVD-Grown Multilayer Graphene (MLG) Film, Journal of Electronic Materials, D. Dutta, S.K. Hazra, J. Das, C.K. Sarkar, S. Basu, 45(6) (2016) 2861-2869.
6. Graphene-Oxide Nano Composites for Chemical Sensor Applications, C Journal of Carbon Research, S.K. Hazra, S. Basu 2 (2016) 12; doi:10.3390/c2020012
7. Performance of a CVD grown graphene-based planar device for a hydrogen gas sensor, Measurement Science & Technology, D. Dutta, A. Hazra, S.K. Hazra, J. Das, S. Bhattacharyya, C.K. Sarkar, S. Basu 26(11) (2015) 115104.
8. Temperature dependent dual hydrogen sensor response of Pd nanoparticle decorated Al doped ZnO surfaces, J. Appl. Phys., D. Gupta, D. Dutta, M. Kumar, P.B. Barman, T. Som, S.K. Hazra, 118 (2015) 164501
9. Role of metallic-like conductivity in unusual temperature-dependent transport in n-ZnO:Al/p-Si heterojunction diode, M. Kumar, S.K. Hazra, T. Som, J. Phys. D., 48(45) (2015) 455301
10. Studies on p-TiO<sub>2</sub>/n-graphene heterojunction for hydrogen detection, D. Dutta, S.K. Hazra, J. Das, C.K. Sarkar, S. Basu, 212 (2015) 84-92, Sensors and Actuators, B: Chemical
11. A low temperature hydrogen sensor based on palladium nanoparticles, D. Gupta, D. Dutta, M. Kumar, P.B. Barman, C.K. Sarkar, S. Basu, S.K. Hazra, 196 (2014) 215-222, Sensors and Actuators, B: Chemical.
12. Growth of Multilayer Graphene by Chemical Vapor Deposition (CVD) and Characterizations, D. Dutta, A. Hazra, J. Das, S. K. Hazra, V. N. Lakshmi, S. K. Sinha, A. Gianonchelli, C. K. Sarkar, S. Basu, Journal of Nano science and Molecular Nanotechnology, (2013), doi:10.4172/2324-8777.S1-004.
13. Anodically grown nanocrystalline titania thin film for hydrogen gas sensors - A comparative study of planar and MAIM device configurations, A. Hazra, S.K. Hazra, E. Bontempi, V.N. Lakshmi, S. Sinha, C.K. Sarkar, S. Basu, 188 (2013) 787-798, Sensors and Actuators, B: Chemical.
14. Studies on Hydrogen Sensing by Anodized Nanoporous Titania Thin Film Using Soft Drink Electrolyte, A. Hazra, S.K. Hazra, D. Dutta, C.K. Sarkar, S. Basu, Frontiers in Sensors 1(2) (2013) 17-26



**Minutes of the Board of Studies Meeting of the Department of Physics and Materials Science on 23<sup>rd</sup> November 2017 at 11:00 AM in JUIT Board Room**

**Agenda I:** Proposal to discuss introduction of M.Sc. Physics Course (Duration: 2-Years Programme Credits: 75), w.e.f. July 2018. [Annexure-I, Brief proposal and course outline].

**Agenda II:** Proposal to appoint Prof. (Dr.) Sukumar Basu as Emeritus/Honorary Professor in the Department of Physics & Materials Science, JUIT, Wagnaghat, H.P. [Annexure-II, Joint publications of Prof. Sukumar Basu with Prof. P.B. Barman & Dr. Surajit K. Hazra, Department of Physics & Materials Science, JUIT].

**The suggestions made in the meeting are as given under:**

The members of BOS present in the meeting approved both the agendas for the Academic Council Meeting.

**Members from Department**

✓ Prof. P.B. Barman	HOD	Chairman
Prof. Sunil K. Khah		
Dr. Vineet Sharma		
Dr. Pankaj Sharma		
Dr. Dheeraj Sharma		
Dr. Rajesh Kumar		
Dr. Surajit Kumar Hazra		
Dr. Ragini R. Singh		
Dr. Sanjiv Kumar Tiwari		

*Handwritten notes and signatures:*  
23/11/17  
on leave  
23/11/2017  
23/11/2017  
23/11/2017  
23/11/17  
23/11/17  
Bengal  
23/11/17  
Adhwa

**Members from other Departments of JUIT**

Prof. Karanjeet Singh	HOD, Mathematics	<i>Karan</i>
Prof. Sunil Bhooshan	HOD, ECE	<i>Sunil</i>
Prof. S.P. Ghrrera	HOD, CSE & IT	<i>S.P. Ghrrera</i>
Prof. Ashok K.Gupta	HOD, Civil	<i>Ashok</i>
Dr. Sudhir Syal	Acting Head, BI & BT	<i>Sudhir</i>

*on leave*  
23/11/17

**The following members were not present in the meeting:**

**Member from Sister Institutes**

Prof. D.K. Rai HOD, Physics & Materials Science, JIIT, Sec.62, Noida

**Member from Other Institutes**

Prof. Anil Vohra Dean, Academic Affairs,  
Kurukshetra University, Kurukshetra, Haryana  
(Professor, Dept. of Electronic Science,  
Kurukshetra University, Kurukshetra, Haryana)