Roll No –

Serial No 186

जीवाजी विश्वविद्यालय

ग्वालियर

डॉक्टर ऑफ फिलॉसफी

प्रमाणित किया जाता है कि मनोज डोगरा को इस विश्वविद्यालय से वर्ष 2009 में राजनीति शास्त्र विषय में डॉक्टर ऑफ फिलॉसफी की उपाधि के लिये योग्य घोषित किया गया है, एतदर्थ उन्हें डॉक्टर ऑफ फिलॉसफी की उपाधि प्रदान की जाती है ।

DOCTOR OF PHILOSOPHY

This is to Certify that Manoj Dogra has been declared eligible for the award of **Doctor of Philosophy** in this University in 2009 in this Political Science subject is admitted to the Degree of **Doctor of Philosophy**.

His / ~~Her~~ Thesis is on "हिमाचल प्रदेश के स्वतन्त्रता संग्राम सैनानी एवं राष्ट्रीय आन्दोलन में उनका योगदान: एक अध्ययन

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Issued on 17 JUN 2013

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'ACADEMIC SECTION'

No.CPUH/ACAD/Ph.D/2025/-6167-46 **Dated: 28.05.2025**

NOTIFICATION

The under mentioned student, having successfully completed all the requirements for the award of the degree of **'Doctor of Philosophy'** of this University, is declared qualified to receive the said degree:

1. Name of the Student - **Jyotsna**
2. Father's Name - **Shri Om Prakash Hooda**
3. UID/ Enrolment No. - **H13959**
4. Discipline - **Physics**
5. Department/School - **Physics/School of Basic and Applied Sciences**
6. Name of Supervisor - **Dr Rajender Kumar**
7. Title of the thesis - **-"Structural, Optical and Temperature Dependent Dielectric Study of Zinc Oxide (ZnO) Incorporated Magnesium Oxide (MgO) Based Compounds"**
8. Cumulative Grade Point Average - **NA**

. **"It is certified that Ms Jyotsna has been awarded Ph.D. in accordance with University Grants Commission (Minimum Standards and Procedure for Award of M.Phil./Ph.D. Degrees) Regulations, 2016 and She fulfills all the five conditions" mentioned in the UGC Notification Published in the Gazette of India (Extraordinary); No 271;Part-III; Section-4; New Delhi dated 18th July, 2018"**

BY ORDER OF THE VICE-CHANCELLOR

Dated: 28.05.2025

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Copy to:-

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4. Secretary, HPPERC, Shimla -171009
5. Registrar of all Statutory Universities in India.
6. Dr Rajender Kumar, Associate Professor (Supervisor of the student) Department Physics, School of Basic And Applied Sciences, CPU Hamirpur H.P.
7. Dr Youd Vir Singh, Library and Documentation Division, Association of Indian Universities (AIU), AIU House, 16-Comrade Indrajit Gupta (Kotla) Marg New Delhi-110002
8. Shri Manoj Kumar K Scientist-E (CS) Information and Library Network Centre (INFLIBNET) Infocity, Gandhinagar-382007.Gujarat, India.
9. Student concerned C/O Head Department Physics/School of Basic and Applied Sciences, Career Point University Hamirpur H.P. 176041.

Registrar
Career Point University
Hamirpur H.P.176041

Registrar
Career Point University
Hamirpur (H.P.) - 176041

The

Maharaja Sayajirao University of Baroda

Whereas ***Shri Anilkumar Shiv Dharam Singh Dogra*** of the Faculty of Arts has pursued a course of study prescribed by the University and passed the requisite Examination

Now therefore this is to certify that he has this day been duly admitted by the Senate to the Degree of

Doctor of Philosophy

(Economics)

Given under my hand this Twenty ninth day of June one thousand nine hundred and ninety nine

self attested

Dr. Anil Dogra

Chancellor

हिमाचल प्रदेश विश्वविद्यालय

विद्या-वाचस्पति-2016

प्रमाणित किया जाता है कि *"PREPARATION AND CHARACTERIZATION OF SOME 4- ETHYLPIPERAZINE-1- FUNGICIDAL STUDIES ON SOME MUSHROOM PATHOGENS"* पर शोध प्रबन्ध स्वीकृत हो जाने के उपरान्त धर्विन्द्र कुमार सुपुत्र/सुपुत्री श्री ध्यान चंद को इस विश्वविद्यालय की विद्या–वाचस्पति की उपाधि पदार्थ विज्ञान (रसायन विज्ञान) संकाय में प्रदान की गई।

Himachal Pradesh University

Doctor of Philosophy-2016

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कुलपति
Vice-Chancellor

कुलाधिपति
Chancellor

शिमला / Shimla } 03rd August, 2016

पंजीकरण संख्या
Enrolment No. } 88-PHM-15

हिमाचल प्रदेश विश्वविद्यालय

विद्या-वाचस्पति-2001

प्रमाणित किया जाता है कि "नरेश मेहता के कथा साहित्य में नारी चित्रण"

पर शोध प्रबन्ध स्वीकृत हो जाने के उपरान्त विजय कुमार

सुपुत्र/सुपुत्री श्री हरनाम सिंह को इस विश्वविद्यालय की

विद्या-वाचस्पति की उपाधि भाषा संकाय में प्रदान की गई।

Himachal Pradesh University

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has been admitted to the degree of Doctor of Philosophy in the

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कुलपति
Vice-Chancellor

कुलाधिपति
Chancellor

WILDLIFE WEEK CELEBRATION

&

INTERNATIONAL COLLOQUIUM ON WILDLIFE CONSERVATION (ICWC-2024)

1-7 OCTOBER 2024

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Of

Chemistry

has successfully participated in seven days Wildlife Week & International Colloquium on Wildlife Conservation held from 1st to 7th October 2024 Organized by Maharaja Ganga Singh University, Bikaner, Rajasthan, India.

Prof. Manoj Dixit Patron, ICWC-2024 Vice Chancellor, MGSU, Bikaner	Prof. Anil Kumar Chhangani Chairperson, ICWC-2024 Head, Dept. of Envi. Science, MGSU, Bikaner	Dr. Mamta Sharma Org. Secretary, ICWC-2024 Assoc. Prof. R.R College, Alwar

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DELHI TECHNOLOGICAL UNIVERSITY

Dr. Sunil Luthra
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Training and Learning Bureau, AICTE

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participated in the Short Term Course on **MOOCS**

held on 22nd - 28th August, 2024.

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University Grants Commission

CERTIFICATE OF PARTICIPATION

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This is to certify that **Mr./Mrs./Ms./Dr./Prof. Mast Ram,** Assistant Professor from Government College Barsar, Himachal Pradesh University, Shimla has completed the NEP 2020 Orientation & Sensitization Programme under Malaviya Mission Teacher Training Programme (MM-TTP) of University Grants Commission (UGC) organized by UGC-Malaviya Mission Teacher Training Centre, Banaras Hindu University, Varanasi - 221005 (U.P.) from February 18 to 27, 2025 and obtained grade (**A**).

Director

Sr. No. 5 International / National + State

INTERNATIONAL CONFERENCE

on

Emerging Trends and Innovations in Basic Sciences (ETIBS-2024)

(22-23 NOVEMBER, 2024)

CERTIFICATE

OF PARTICIPATION

S. NO. CPUH/ETIBS-2024/207

This is certified that Prof/Dr/Mr/Ms Jyotsna of Career Point University Hamirpur, Himachal Pradesh. has participated and presented a paper as **Oral/Poster Presentation** on the topic — Crossover of Conduction Mechanism in MgO based Ceramic. in **International Conference** on **"Emerging Trends and Innovations in Basic Sciences (ETIBS-2024)"** organized by School of Basic & Applied Sciences, **Career Point University, Hamirpur (H.P.) India** in collaboration with **The University of The West Indies , St. Augustine, Trinidad and Tobago, West Indies** on 22-23 November 2024.

CONVENOR
ETIBS-2024

VICE CHANCELLOR
CAREER POINT UNIVERSITY, HAMIRPUR (H.P.), INDIA

Sr. No. 51

International Conference

on

Advances in Mathematics and Applied Sciences

(ICAMAS-2025)

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Certificate

This is to certify that **Jyotsna, Assistant/Associate Professor,**
Govt. College Barsar (Hamirpur) has participated and presented a paper
on the topic **Modifications in Structural and Optical properties of thin films of Y2O3** during
the International Conference on "**Advances in Mathematics and Applied Sciences**"
organised by the Department of Mathematics, NSCBM Govt. College, Hamirpur (H.P.) from March 27-28, 2025

Dr. Sanjay Kango
Convener

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Principal-cum-Patron

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International Conference

on

Advances in Mathematics and Applied Sciences

(ICAMAS-2025)

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during the International Conference on "Advances in Mathematics and Applied Sciences" organised by the Department of Mathematics, NSCBM Govt. College, Hamirpur (H.P.) from March 27-28, 2025.

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(182)

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National Conference on "Rhythms in Interdisciplinary Sciences (RIS - 2025)"

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has participated and presented a paper (Oral/Online)/delivered invited talk on the topic entitled Industrial-ization in Himachal Pradesh: Enviromchtal Challenges and the path to...

in the National Conference on "Rhythms in Interdisciplinary Sciences (RIS - 2025)" organized by the IQAC, Faculty of Science and Computer Science of our college on Saturday, 29th March, 2025.

Dr. R. S. Diggikar
Convenor

Prof. R. B. Kharade
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Dr. R. K. Aher
Director

Sr. No. 81

International Conference

on

Advances in Mathematics and Applied Sciences

(ICAMAS-2025)

March 27-28, 2025

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This is to certify that **Sanjeev Kumar, Assistant/Associate Professor,**
Department of Commerce, Govt. College, Barsar Distt. Hamirpur (H.P.) has participated and presented a paper on the topic **Mathematical Foundations of Statistical Inference: Advances and Applications** during the International Conference on **"Advances in Mathematics and Applied Sciences"** organised by the Department of Mathematics, NSCBM Govt. College, Hamirpur (H.P.) from March 27-28, 2025.

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Advances in Mathematics and Applied Sciences

(ICAMAS-2025)

March 27-28, 2025

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Department of Mathematics, Govt. College, Barsar, Distt. Hamirpur (H.P.)
has participated and presented a paper on the topic
" Use of Mathematics in Agriculture and Horticulture Sciences"
during the International Conference on "Advances in Mathematics and Applied Sciences" organised by the Department of Mathematics, NSCBM Govt. College, Hamirpur (H.P.) from March 27-28, 2025.

Dr. Sanjay Kango
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Spectroscopic analysis of defect-induced luminescent and dielectric properties of MgO-based composites on varying dopant concentration

Jyotsna [a], Rajender Kumar [a,*], Ravi Kumar [b], Ravinder Kumar [b]

[a] Department of Physics, Career Point University, Bhoruj (Tikker-Kharwarian), Hamirpur, Himachal Pradesh 176041, India
[b] Department of Materials Science and Engineering, National Institute of Technology, Hamirpur, Himachal Pradesh 177005, India

ARTICLE INFO

Keywords:
Ceramic composites
Solid-state reaction
F-centers
Multiple excitations
High-k dielectrics

ABSTRACT

In this novel study, we prepared MgO matrix composites reinforced with varying weight percent ZnO using a solid-state reaction (SSR) method at 500 °C. We aimedto explore the potentialof these composites for high-frequency electronic devices.We conducted a comprehensive structural analysis of these MgO-based composites using various spectroscopic and microscopic techniques. Thisinclusive analysis revealed the morphology, particle size, elemental composition, valence states of elements, and defects in the composites. The Rietveld refinement of XRD data confirmed the presence of binary phase and the phase % of the constituents of composites. XPS spectra demonstrated the isovalent character of Zn/Mg elements and the presence of low-coordinated oxygen ions at the surface of the composites. The UV-visible-based spectroscopic techniques (Absorption and Photoluminescence) further supported the presence of low-coordinated surface O^{2-} ions and F-center defects that caused a significant reduction in the bandgap of the samples. Photoluminescence (PL) analysis suggested the passivation of F-center defects in composites. We also investigated the effect of ZnO concentration and multiple excitation energies on the site-specific localized F-center defects to understand the defect distribution in the composites relative to the host.

The dielectric properties of ZnO/MgO composites were assessed through impedance spectroscopy. We observed a significant enhancement in the dielectric constant (~ 28.69–32.60) of the composites compared to pure MgO (~12.2) at 1 kHz. This enhancement along with the smaller impedance of the composites relative to the host, as endorsed by the PL results,suggests areduction in F-centers (electrical barriers). This exciting finding paves the way forthe synthesis of ceramic composites with excellent dielectric and optical properties, indicating their potential applications in high-frequency electronic devices.

1. Introduction

Magnesium oxide (MgO) is a multifunctional ceramic oxide owing to its fascinating properties such as antibacterial, catalytic, bio-sensing, UV-detection, non-toxic nature, wide bandgap, high melting point, and many more [1–3]. It continues to be an attractive choice for applications in solid-state microelectronics and optoelectronics.For the past decades, intense research hasbeen focussed on exploringa suitable high-k dielectric metal oxide tofulfil the requirements for continuous scaling of electronic devices[4–8]. In this regard, MgO (k ~9.8) has been reported to improve the issues related to leakage current and dielectric thickness in electronic devices [9–11]. The significant properties of MgO, such as dielectric, magnetic, and luminescent, are directly or indirectly correlated to native defects in its lattice [12]. Various theoretical studies reported structural intrinsic defects, such as cationic-vacancies (V_{Mg}), -interstitials (Mg_i), anionic-vacancies (F-centers), and -interstitials (O_i) in pure MgO[13–15]. For applications in microelectronics, defect-free oxide ceramic is ideally required to display excellent dielectric properties. The paramagnetic defects are vital in deciding their magnetic properties for spintronics and magnetic recording devices [12].The defect-induced photoluminescence in MgO makes it a potential substitute for customary metal activator-based phosphors for optoelectronic applications. However, its prevalent intrinsic defects and modest dielectric constant result in its substandard electronic properties, detrimental to its electronic device applications [14]. So, there is a need to focus on synthesizing oxide ceramics with reduced defects and higher dielectric constant for dielectric applications.

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Studies on Fungal Associates of *Acacia catechu* (L.f.) Willd. – A Medicinal Plant

Sunil Pathak[1] and Babita Suman[2]

[1]*Department of Botany, Govt. College, Barsar, H.P., India*
[2]*Department of Botany, NSCBM Govt. College, Hamirpur, H.P., India*

(Received 30 January, 2024; Accepted 3 April, 2024)

ABSTRACT

Fungal associates of *Acacia catechu* growing in district Hamirpur of Himachal Pradesh were studied, identified and are being reported in the present research paper. The rhizosphere of *Acacia catechu* revealed the presence of twenty three species of fungi. Seven species of AMF (Arbuscular Mycorrhizal Fungi) belonging to three genera (*Acaulospora*, *Gigaspora* and *Glomus*) were isolated from roots adhering soil. Leaves and bark of this plant revealed the presence of three endophytic fungal species belonging to three genera namely, *Aspergillus niger*, *Cladosporium cladosporioides* and *Fusarium solani*. Further research of endophytes can be beneficial for the production of secondary metabolites and for bioprospecting.

Key words: Medicinal plant, AMF, Rhizosphere, Endophytes, Bioprospecting

Introduction

The fungi occupy prime place in the biological world (Hawksworth *et al.*, 1995). They consist of large and heterogenous group of microorganisms permeating the surface layer of soil with their mycelium. Arbuscular mycorrhizal fungi (AMF) are ubiquitous, soil-borne, endophytic, obligate biotrophs that colonize the roots of most of the terrestrial plants in various soil types and environmental conditions to establish mutually beneficial relationships (Branco *et al.*, 2022; Shi *et al.*, 2023). Taxonomically, AMF belong to the phylum Glomeromycota (Giovannini *et al.*, 2020). The name AMF denotes the peculiar relationship between plant roots and mycorrhizal fungi and its key features, wherein "Arbuscule" stands for a special treelike fungal (hyphal) structure in the inner cortex of the root that is used for resource-exchange between "plant root" and "AMF," whereas "mycorrhiza" derived from two words "myco," meaning fungus, and "rhiza," meaning "root" (Shi *et al.*, 2023).

In plant-AMF symbiosis, host plant supply carbon (C) substances such as sugars and lipids to AMF (Jiang *et al.*, 2017). AMF provide mineral nutrients, particularly phosphorus (P) and nitrogen (N) to the host plant (Wipf *et al.*, 2019). This nutrient exchange strongly impacts plant and microbial ecosystems by influencing plant fitness, core soil processes and the C cycle (Diagne *et al.*, 2020; Giovannini *et al.*, 2020). AMF assist the roots of the host plant with their extensive hyphal network in absorbing water and nutrients, thus minimize the requirement for chemical fertilizers and irrigation (Kakouridis *et al.*, 2022). AMF are found in various kinds of habitats including severely disturbed ecosystems containing soils polluted with excessive salt, xenobiotics and heavy metals (Boorboori and Zhang, 2022; Branco *et al.*, 2022; Ahammed *et al.*, 2023). AMF help in plant development and stress tolerance such as drought

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Fungal Associates of Medicinal Plant *Azadirachta indica* A. Juss

Sunil Pathak[1] and Babita Suman[2]

[1]Department of Botany, Govt. College, Barsar, H.P., India
[2]Department of Botany, NSCBM Govt. College, Hamirpur, H.P., India

(Received 31 January, 2024; Accepted 3 April, 2024)

ABSTRACT

Fungal associates of medicinal plant *Azadirachta indica* A. Juss growing in district Una, Himachal Pradesh were investigated identified and are reported in the present paper. Twenty-two species of fungi were recorded from rhizosphere of *Azadirachta indica*. Seven species of Arbascular Mycorrhizal Fungi (AMF) belonging to three genera (*Acaulospora, Gigaspora* and *Glomus*) were isolated from root adhering soil of the plant. Leaves and bark of the plant revealed the presence of three endophytic fungal species belonging to three genera, i.e. *Fusarium, Gliocladium* and *Trichoderma*. Further study of endophytes can be useful for the production of secondary metabolites and bio prospecting.

***Key words**: Fungal associates, AMF, Rhizosphere, Endophytic fungi, Secondary metabolites*

Introduction

The variety and galaxy of fungi occupy prime place in the biological world (Hawksworth *et al.*, 1995). Fungi form a large and heterogenous group of microorganisms permeating the surface layer of soil with their mycelium. Arbuscular mycorrhizal fungi (AMF) are ubiquitous, soil-borne, endophytic, obligate biotrophs that colonize the roots of most of the terrestrial plants in various soil types and environmental conditions to establish mutually beneficial relationships (Branco *et al.*, 2022; Shi *et al.*, 2023). Systematically, AMF belong to the phylum Glomeromycota (Giovannini *et al.*, 2020). In plant-AMF symbiosis, host plant supply carbon (C) substances such as sugars and lipids to AMF (Jiang *et al.*, 2017). AMF provide mineral nutrients, especially phosphorus (P) and nitrogen (N) to the host plant (Wipf *et al.*, 2019). This nutrient exchange has strong impact on plant and microbial ecosystems as it influences plant fitness, core soil processes and the C cycle (Diagne *et al.*, 2020; Giovannini *et al.*, 2020). AMF aid the roots of the host plant with their extensive hyphal network in absorbing water and nutrients, thus decrease the need of chemical fertilizers and irrigation (Kakouridis *et al.*, 2022). AMF are found in various kinds of habitats including severely disturbed ecosystems containing soils polluted with excessive salt, xenobiotics and heavy metals (Boorboori and Zhang, 2022; Branco *et al.*, 2022; Ahammed *et al.* 2023). AMF aid in plant development and stress tolerance such as drought (Begum *et al.* 2019), salinity (Cui *et al.*, 2022; Li *et al.*, 2022), nutrient deficiency (Shi *et al.*, 2021) or heavy metal stress (Dhalaria *et al.*, 2020; Alam *et al.*, 2019). AMF have potential applications in crop production, forestry management, bioremediation and ecological restoration as biofertilizers and bioprotectors (Phour *et al.*, 2020; Boorboori and Zhang, 2022; Zhu *et al.*, 2022). The effective management and assess-

([1]Assistant Professor, [2]Assistant Professor)
***Corresponding author's email:** pathak.sunil13@gmail.com*

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Volume: I Issue: III January, 2025

TABLE OF CONTENT'S

Sr. No Resource Person/Subject expert

Certificate ID:
ECOLS /2024/001

DEPARTMENT OF ECONOMICS
GOVT DEGREE COLLEGE BARSAR

Local Seminar
National Education Policy 2020:Sequel on Academia in India

CERTIFICATE OF PARTICIPATION

This is certify that Students/Dr./Assistant Professor/ ~~Associate Professor~~ ..VIJAY KUMAR..... participated as Key note speaker / Organizing Secretary /Resource person in the three days local seminar organized by the Economics Department of Government Degree College Barsar from 4th April to 6th April 2024. HE / She also presented a paper on ...Importance of National Education Policy six India.....

Dr. Anil Kumar (Associate Professor
Organizing Secretary

Dr. Vijay Kumar
Convenor

Principal Rakesh Kumar
Patron

Sl. No. -10
Members of board of studies / Subject expert

From:

Chairman
BOS, UG under NEP 2020
Physics Department

To

All Faculty members

Subject: **Request to draft the syllabus in the subject of Physics for UG Classes under NEP 2020.**

Sir/Madam

It is for your information that a meeting of the subject committee duly constituted by the Hon'ble Vice-Chancellor to draft the syllabus of B.SC MULTIDISCIPLINARY COURSE (PHYSICS) and MAJOR COURSE in Physics was held on 27th November,2024. In this meeting it was decided that to frame the course content of the different courses, faculty members of various colleges of the state will be involved. The name of the faculty and title of the course to be drafted by him/her are mentioned below in the table. All the worthy faculty members are requested to submit the draft syllabus of the assigned course by 15th December, 2024 to the undersigned by e-mail.

Sr. No.	Subject	Name of Faculty Member
1.	***Vibration, Waves and Optics*** DSCUG-PHT-231(a) **(3Cr) (70)** DSCUG-PHP-231(b) **(1Cr) (30)** **DSC-3B**	Dr. Anil Kumar, G.C. Solan
2.	***Solid State Physics and Electronics*** DSCUG-PHT-241(a) **(3Cr) (70)** DSCUG-PHP-241 (b) **(1Cr) 30)**	Dr. Shalini Sharma, G.C. Nalagarh
3.	***Computational Physics*** ***DSE-PHYT-241 (a) (3cr) (70)*** ***DSE-PHYP-241 (b) (1cr) (30)***	Dr. Arun, G.C.Bilaspur
4.	***Nuclear and particle physics*** DSCUG-PHT-351(a)**(3Cr) (70)** DSCUG-PHP-351 (b) **(1Cr) (30)**	Mr. Lalit Kumar, G.C. Rampur
5.	**Digital Electronics** DSEUG-PHT-352 (a) **(3Cr) 70)** DSEUG-PHP-352 (b) **(1Cr) (30)**	Dr. Akashdeep, G.C. Chewari, Chamba
6.	**Basic of Quantum Mechanics** DSEUG-PHT-241(a) **(3Cr) (70)** DSEUG-PHT-241(b) **(1Cr) (30)**	Dr. A.V. Nidhi, G.C. Solan
7.	***Statistical and Thermal Physics*** DSEUG-PHT-361(a)**(3Cr) (70)** DSEUG-PHT-361 **(1Cr) (30)**	Dr. Brij Mohan, G.C. Kotshera
8.	**Laser and Optical Fibre Communication** DSCUG-PHT-232 (a) **(3Cr) (70)** DSCUG-PHP-232 (b) **(1Cr) (30)**	Ms. Jyotsna, G.C. Barsar
9.	**Atomic and Molecular Physics** DSCUG-PHTH-363 **(4Cr) (100)**	Dr. Anup Kumar, G.C. Nahan
10.	**Solid State Physics-II** DSEUG-PHTH-366**(4Cr) (100)**	Dr. Shalini Sharma, G.C. Nalagarh
11.	**Experiment in Physics-I** DSCUG-PHP-242 **(4Cr) (100)** **(Vibration, Optics, Waves, Laser)**	Ms. Sapna Verma, G.C. Kullu
12.	**Experiments in Physics -II** DSCUG-PHP-352 **(4Cr) (100)** **(Solid State and Electrical, Computer)**	Dr. Anup and Ms. Richa, G.C. Nahan
13.	**Experiments in Physics -III** DSCUG-PHP-362 **(4Cr) (100)** **(Nuclear 7 Digital Electrical)**	Dr. Akashdeep, G.C. Chewari, Chamba

Thanking you

Yours Truly

Chairman
BOS UG under NEP 2020
Deptt. of Physics
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