

MECHANICAL ENGINEERING DEPARTMENT

Progress Report for the period July-September, 2020

A. EDUCATION AND TRAINING PROGRAMMES

I. Long Term Courses

Type of Programmes	Delivery Method	Faculty
Theory Classes: M.E. Mechanical Engineering (Manufacturing Technology), Regular Batch 2019, 3rd Semester	Online through WebEx / Google Meet / Google Classroom	Prof. BS Pabla Prof. Rupinder Singh
Theory Classes: M.E. Mechanical Engineering (Manufacturing Technology), Modular, Batches 2018 – Spell V & 2019 – Spell III	Online through WebEx / Google Meet / Google Classroom	Prof. BS Pabla Prof. Rupinder Singh
Thesis & Pre-Thesis Guidance: <ul style="list-style-type: none"> • M.E. Mechanical Engineering (Manufacturing Technology), Regular, Batches 2018 & 2019 • M.E. Mechanical Engineering (Manufacturing Technology), Modular, Batch 2017 	Online through WebEx / Google Meet	Prof. BS Pabla Prof. SS Banwait Prof. SS Dhami Prof. Rupinder Singh Dr. PS Rao

Academic Proposals submitted:

Diploma / Degree	Eligibility for Admission	Passing Criterion
M.E. Mechanical Engineering (Robotics), w.e.f. 2020-21	B.E. / B.Tech. / AMIE (registered before 31-05-2013)	Successful Completion of Semester – I, II, III and IV
M.E. Mechanical Engineering (Digital Manufacturing), w.e.f. 2025-26	B.E. / B.Tech. / AMIE (registered before 31-05-2013)	Successful Completion of Semester – I, II, III and IV
PG Diploma in Additive Manufacturing, w.e.f. 2022-23	Diploma / B.E. / B.Tech. / B.Sc. / AMIE (registered before 31-05-2013)	Successful Completion of Semester – I, II
PG Diploma in Material Characterization, w.e.f. 2023-24	Diploma / B.E. / B.Tech. / B.Sc. / AMIE (registered before 31-05-2013)	Successful Completion of Semester – I, II
PG Diploma in Institutional Assessment, Accreditation and Ranking, w.e.f. 2021-22	Diploma / B.E. / B.Tech. / B.Sc. / AMIE (registered before 31-05-2013)	Successful Completion of Semester – I, II
Advanced Certificate Program in Robotics, 2022-23	Diploma / B.E. / B.Tech. / B.Sc. / AMIE (registered before 31-05-2013)	Successful Completion of Semester – I

II. Short Term Courses

S. No.	Oplan No.	Programme Title	Start Date	Ending Date	Coordinator(s)	Course Fees
1	ICTO-CP-01	Accreditation of Engineering Programs	29/06/2020	03/07/2020	Dr. B. S. Pabla	590/-

S. No.	Oplan No.	Programme Title	Start Date	Ending Date	Coordinator(s)	Course Fees
2	ICTO-87	Materials Processing and Optimization	06/07/2020	10/07/2020	Dr. Rupinder Singh	118/-
3	ICTO-96	Engineering Optimization	13/07/2020	17/07/2020	Dr. B. S. Pabla Dr. S. S. Dhama	118/-
4		5-Days Webinar Series on Atmanirbhar Bharat: Transmutation from Privation to Exuberance	27/07/2020	31/07/2020	Prof. Rupinder Singh	
5	ICTO-156	Repair and Maintenance of Machine Tools	17/08/2020	21.08.2020	Er. Sunil Jassal	118/-
6	ICTO-202	Advances in Manufacturing (AMM)	07.09.2020	11.09.2020	Er. Sunil Jassal Dr. PS Rao	118/-
7	ICTO-122	Refresher Course in Mechanical Engineering	10.08.2020	21.08.2020	Dr. Rupinder Singh Dr. SS Banwait	118/-
8	ICTO-213	Additive Manufacturing for Biomedical Applications			Dr. Rupinder Singh	118/-
9	ICTO-123	Ergonomics and Product Design	07.09.2020	11.09.2020	Dr. SS Banwait	118/-

Total no. of participants trained: 1600

III. MOOCs Swayam Courses –NIL

B. INSTRUCTIONAL MATERIAL DEVELOPMENT

Name of the Team Member	Title of the Content developed	Video Scripts developed with Assignments and Quiz	Lab Manuals developed
Dr. Rupinder Singh	PPT for subject on 3D printing		
Dr. S. S. Dhama	PPT on Python Programming for Mechanical Engineering Applications		

Target For Activity VII (Instructional Material Development)

S.No.	Name of Programme / Project	Long Term / Short Term	Type of Instructional Material	Coordinator(s)	Time Period	Expectation during four quarters of six months each (4 Nos) for a total period of next 2 years
1.	Instructional Material on Optimization Techniques	Long term	Online Instructional Material & print	Dr. B. S. Pabla	2 years	First draft in first year Final draft in next six months

S.No.	Name of Programme / Project	Long Term / Short Term	Type of Instructional Material	Coordinator(s)	Time Period	Expectation during four quarters of six months each (4 Nos) for a total period of next 2 years
						MOOCs Development in last six months
2.	Instructional Material on Robot Modeling & Simulation	Long term	Online Instructional Material & print	Dr. Sukhdeep S. Dhani	2 years	First draft in first year Final draft in next six months MOOCs Development in last six months
3.	Instructional Material on low cost polymer 3D printing	Short term	Online Instructional Material & print	Dr. Rupinder Singh	0.5 years	First draft in 3 months Final draft in next three months MOOCs Development in three months along with final draft submission
4.	Instructional Material on metal 3D printing	Short term	Online Instructional Material & print	Dr. Rupinder Singh	0.5 years (after completion of stage 1)	First draft in 3 months (after completion of stage 1) Final draft in next three months MOOCs Development in three months along with final draft submission
5.	Instructional Material on combining polymer, metal and bio printing	Long term	Online Instructional Material & print	Dr. Rupinder Singh	1.0 years (after completion of stage 1 and 2)	First draft in 6 months Final draft in next three months MOOCs Development in next three months
6.	CAD/CAM	Short Term	Reading material	Dr P S Rao	04 months	First 04 months
7.	RPT Techniques	Short Term	Reading material	Dr P S Rao	04 months	Then 04 months
8.	Mfg processes	LongTerm	Chapters	Dr P S Rao	04 months	Then 04 months

C. CURRICULUM DEVELOPMENT

1. Workshop for revision of curriculum for Diploma in (a) Mechanical Engineering (b) Production Engineering and (c) Maintenance Engineering for Delhi State; 17-08-2020 (Prof. B. S. Pabla)
2. Workshop for revision of curriculum for Diploma in (a) Mechanical Engineering (b) Production Engineering and (c) Maintenance Engineering for Delhi State; 24-09-2020 (Prof. B. S. Pabla & Prof. S. S. Dhami)
3. Workshop on Design of NSQF Compliant Curriculum for Diploma program in Automobile Engineering Delhi State; 02-07-2020 (Prof. S. S. Dhami)

D. RESEARCH AND DEVELOPMENT

I. PhD Guidance

Prof. BS Pabla ----- 2

Prof. SS Banwait --- 2

Prof. SS Dhami --- 3

Prof. Rupinder Singh----- 6

Rao - 2

II. PhD Awarded - NIL

III. ME Thesis Viva Conducted for following candidates.

NAME AND BATCH	THESIS TITLE
Manoj Kumar Sharma 151214	Effect of Aisin Coatings on Erosion Characteristics of Aluminium Alloy 6082 for Hydro Turbine Applications
Nishant Kumar 161204	Analysis and Optimization of Effective Parameters during Electric Discharge Machinin of Incoloy 800
Kumar Manoj 172207	Defect Analysis and Process Parameter Otimistion in Sand Casting

IV. Research Publications

Faculty	SCI Indexed Journals	Scopus Indexed Journals	UGC/AICTE Approved Journals	Any other Journals	Total
Prof. Rupinder Singh	3	-	-	3	6
Prof. SS Banwait	1	-	2	-	3
TOTAL	4			-	9

Details of Publications

S. No.	Paper Title	Authors	Journal Details	PP
1	Thermo-mechanical investigations for friction stir spot welding of dissimilar thermoplastic	Ranvijay Kumar, Rupinder Singh, IPS Ahuja, Antioio Fortunato	Composite Structures, 253, 2020	112772 (1-17)
2	Repair of automotive bumpers and bars with modified friction stir welding	R.Kumar, Rupinder Singh and IPS Ahuja	Jol. of central south university, 27, 2020 DOI: 10.1007/s11771-020-4445-4 (Springer publications)	2239–2248
3	Investigations for partial denture casting by fused deposition modelling assisted chemical vapour smoothing	Gurpartap Singh, Rupinder Singh, Sarbjit Singh	Assembly Automation, Vol. 40, No. 5, 2020 DOI: 10.1108/AA-03-2020-0048 (Emerald publications)	745-754
4	On effect of chemical assisted mechanical blending of barium titanate and graphene in PVDF for 3D printing applications	Ravinder Sharma, Rupinder Singh, Ajay Batish	Journal of Thermoplastic Composite Materials, 2020 DOI: 10.1177/0892705720945377 (Sage Publications)	1-27
5	On investigations of thermal conductivity, circumferential compressive strength and surface characterization of 3D printed hybrid blended magnetostrictive PLA composite	Sudhir Kumar, Rupinder Singh, T.P.Singh, Ajay Batish	Journal of Thermoplastic Composite Materials, 2020 DOI: 10.1177/0892705720907651 (Sage Publications)	1-20
6	Post processing of ABS replicas with vapour smoothing for investment casting applications	J.S.Chohan, Rupinder Singh, K.S.Boparai	Proc. Natl. Acad. Sci., India, Sect. A Phys. Sci., 2020 (Springer Publications) DOI: 10.1007/s40010-020-00669-x	In-Press (1-6)

V. Books Published

1. Editor for book on '3D Printing in Biomedical Engineering' (Co-Editor: Singh, Sunpreet, Prakash, Chander), Springer, 2020, ISBN ISBN 978-981-15-5424-7. (Published)
2. Editor for book on 'Non-Conventional Hybrid Machining Processes: Theory and Practice' Part of the Manufacturing Design and Technology Series (Series Editor: J. Paulo Davim), CRC Press, Taylor & Francis, 2020. (In-Press)
3. Guest Editor for Special Collection on 'Nano-Composites and Smart Materials: Design, Processing, Manufacturing and Applications' in Advanced Composites Letter, 2020 (SAGE publications, SCIE, Impact Factor 0.55).(In-Press)

4. Editor for book on ‘4D Printing: Fundamentals and Applications, Elsevier, 2021.(to be closed in Dec. 2020)
5. Section Editor for ‘Fundamentals of thermoset and thermoplastic polymers & their recycling and sustainability’ as part of Encyclopedia of materials: plastics and polymers (M. Saleem. J. Hashmi, ‘Editor-in-Chief’), Elsevier, (to be closed in 2021).
6. Guest Editor for Special issue “3D and 4D Hybrid Printed Functional Prototypes” Materials International Open Access Journal (ISSN: 2668-5728)

VI. Research Projects Submitted

1. Recyclable 3D printed dry cell as alternate sources of energy; PI: Prof. Rupinder Singh, Co-PI: Prof. B.S.Pabla; Cost: 4.5 Lacs; Funding Agency: DST Chandigarh
2. Recycling of plastic solid waste for environmental protection by multi-hybrid material 3D printing for 4D applications; PI: Prof. Rupinder Singh, Co-PI: Prof. B.S.Pabla; Cost: 54.5 Lacs; Funding Agency: DST (India–Portugal Programme of Cooperation in Science and Technology)
3. Hands on Training on 3D Printing for bio-medical applications; PI: Prof. Rupinder Singh; Cost: 4.0 Lacs; Funding Agency: SERB

VII. Grant received for Research Project/sponsored project - NIL

VIII. Research Project/Sponsored Project In progress

1. Upgradation of Simulation Centre of Excellence sponsored by ABB India Ltd., Bengaluru (Rs. 165 lakh)

E. EXTENSION SERVICES AND CONSULTANCY

S. No.	Extension Services Project	Date(s) / Period	Remarks
1	AICTE Meeting for considering the representation of Satish Kumar for considering previous service while working on contract, 01-07-2020 (Prof. B. S. Pabla)	01 July , 2020	Completed
2	AICTE Committee meetings on finalization of Utkrisht Sanshthan Visvkarma Awards; September 12 to 14, 2020 (Prof. B. S. Pabla/Dr. SS Dhami)	11-15 Sept, 2020	Completed
3	Workshop for revision of curriculum for Diploma in (a) Mechanical Engineering (b) Production Engineering and (c) Maintenance Engineering for Delhi State; 17-08-2020 (Prof. B. S. Pabla)	17 August, 2020	Completed
4	Workshop for revision of curriculum for Diploma in (a) Mechanical Engineering (b) Production Engineering and (c) Maintenance Engineering for Delhi State; 24-09-2020 (Prof	24 Sept, 2020	Completed
5	Workshop on Design of NSQF Compliant Curriculum for Diploma program in Automobile Engineering Delhi State; 02-07-2020 (Prof. S. S. Dhami)	02 July, 2020	Completed

S. No.	Extension Services Project	Date(s) / Period	Remarks
6	Vetting of Proposals for "Upgradation of Infrastructure" of Government Polytechnic College, UK state; 18-08-2020 (Prof. S. S. Dhami)	18 August, 2020	Completed

F. PURCHASE STATUS

S.NO.	GeM/ETENDER/QUOTATIONS	PO DATE (DD/MM/YY)	PAID IN	ITEM	QTY	TOTAL PRICE	STATUS
1	E-Tender	17-Mar-2020	2020-21	Bio Printer	1	11,59,000/-	DELIVERED & INSTALLED

G. TRAINING ATTENDED – NIL

H. TASK FORCE ACTIVITIES

S. No.	Activities	Tentative Time
<u>Activity – II: Aatmanirbhar Bharat Abhiyaan</u> (Coordinator: Prof. Rupinder Singh)		
1.	<p>Two Year Strategic Plan</p> <p>Long term programs</p> <ul style="list-style-type: none"> • Certificate programs in Aatmanirbhar Bharat for start up (3 Months) at Institute Level <p>Short term programs (Minimum 02 events per Dept. in a Calendar Year)</p> <p>Thrust areas for STCs will be aligned with SERB, AV schemes as under:</p> <ul style="list-style-type: none"> • ABHYAAS (a program to boost Research & Development in the country by enabling and grooming potential PG / PhD level students by developing dedicated research skills in selected areas / disciplines) • High-End Workshops (KARYASHALA) • Research Internships (VRITIKA) • STC on Aatmanirbhar Bharat for sensitization of faculty and research scholars <p>Industry-Academia Collaboration (Minimum 01 per Dept. in a calendar year)</p> <ul style="list-style-type: none"> • Short Term Courses for Industry on <u>Aatmanirbhar Bharat</u> • M.E. project work in industry focussing startup India • Collaborative projects with industry funding 	Upto 31 August 2022

	<p>Foreign-University Collaboration (Minimum 01 per Dept. in a calendar year)</p> <ul style="list-style-type: none"> • Joint thesis/project work • Faculty / Student Exchange • GIAN courses 	
<p><u>Activity – VI: R&D, Consultancy and Patenting</u> (Co-Coordinator: Prof. Rupinder Singh)</p>		
2.	<p>Two Year Strategic Plan</p> <ul style="list-style-type: none"> ➤ One R&D project by each faculty in a calendar year ➤ One SCI indexed publication or two Scopus indexed publications by each faculty in a calendar year. ➤ Faculty members will be encouraged file patents. 	Upto 31 August 2022
<p><u>Activity – VIII: In-house Product Development</u></p>		
3.	<p><u>3D Printed veterinary teeth</u> (Coordinators: Prof. Rupinder Singh & Prof. S. S. Banwait)</p> <ul style="list-style-type: none"> • In collaboration with Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana. 	Upto 31 March 2021
4.	<p><u>3D Printed veterinary orthopedic implants</u> (Coordinators: Prof. Rupinder Singh & Prof. B. S. Pabla)</p> <ul style="list-style-type: none"> • In collaboration with Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana 	Upto 31 October 2021
5.	<p><u>3D Printed veterinary hard tissues</u> (Coordinators: Prof. Rupinder Singh & Prof. S. S. Dhami)</p> <ul style="list-style-type: none"> • In collaboration with Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana 	Upto 31 March 2022

I. OTHER ACTIVITIES

1. Preparation & submission of proposal to UGC for grant of Deemed University status (Prof. B. S. Pabla)
2. AICTE Meeting for considering the representation of Satish Kumar for considering previous service while working on contract, 01-07-2020 (Prof. B. S. Pabla)
3. AICTE Committee meetings on finalization of Utkrisht Sanshthan Visvkarma Awards; September 12 to 14, 2020 (Prof. B. S. Pabla)
4. Preparation of *Infrastructure Development Plan* for the proposal for grant of Deemed University status (Prof. S. S. Dhami)
5. Vetting of Proposals for "Upgradation of Infrastructure" of Government Polytechnic College, UK state; 18-08-2020 (Prof. S. S. Dhami)
6. Expert Lectures in various academic activities conducted by outside organizations (Prof. B. S. Pabla, Prof. S. S. Banwait, Prof. S. S. Dhami, Prof. Rupinder Singh, Dr. P. S. Rao)
7. External Examiner for Ph.D. & M.E. examination in outside organizations (Prof. B. S. Pabla, Prof. S. S. Dhami, Prof. Rupinder Singh, Dr. P. S. Rao)

- Dr. S. S. Dhami, Professor & Head