BEST PRACTICE -1

1. **Title: 'Digital teaching-learning action plan'**

2. **Objectives of the practice:** The objective of putting this action plan in place was

   — To meet the challenges of conducting teaching-learning-evaluation (T-L-E) activities in a fully 'digital only' mode due to COVID-19
   — To have a detailed policy and action plan to serve as a guideline for the conduction of (i) Theory Classes (ii) Practical Classes (iii) Continuous weekly evaluation through quizzes & assignments (iv) Additional/special classes for remedial purposes and (v) Mid-semester evaluation.
   — To have clarity, uniformity, discipline and an effective mechanism of T-L-E for the students, faculty and technical staff during the disturbing pandemic times when some learners and faculty were facing bandwidth/connectivity/digital resource challenges

3. **The Context:**
   — When a sudden nationwide lockdown was imposed in March 2020 due to the COVID-19 pandemic, the T-L-E activities had to be shifted to digital mode in a fire fighting mode.
   — However, when the new semester started in July 2020, the institute attempted to put all the practices and provisions in black and white to bring clarity and avoid any kind of panic among students regarding missing out on their career and learning goals.
   — The "Digital Teaching-Learning Action Plan" was prepared by customizing the PRAGYATA guidelines of Ministry of Education, (then MHRD), New Delhi to the scheme, scope and needs of engineering education.
   — All the faculty & staff members were asked to follow these guidelines meticulously in word and spirit to and to use innovative methods and interesting tools, marking a shift from traditional teaching to student centric activity based learning.
   — The guidelines for digital teaching learning were prepared and circulated well in advance on 26th June 2020. The plan was reviewed by the IQAC on 29th August 2020 vide Item no 3.

4. **The Practice:**
   - The **PRAGYATA guidelines** issued by the **Ministry of Education (then MoHRD) , GoI, for digital education**, included **eight steps** of online education that is, Plan, Review, Arrange, Guide, talk, Assign, Track, and Appreciate.
   - The institute prepared a weekly digital learning & assessment plan and it was circulated vide order no 44 dated 16th July 2020 permitting the following modes for teaching-learning:

   (1) Synchronous Mode: This is **online collaborative learning through video conferencing or interactive online class using zoom, Google meet** or similar other platforms.

(2) Asynchronous Mode: This learning happens when the teacher & students are not connected in real time, for example when learning or communication is through e-mails, whatsapp groups, SMS or MOODLE.

(A) On-line Mode: Learning in this mode can be of the following types:

- **Flipped class:** Teachers ask students to study the shared learning material before coming to online class and then discuss and ask questions during the interactive class conducted through video conferencing platforms.
- **Regular online class**: The faculty conducts the regular scheduled classes through any of the chosen online platforms.
- **Live class**: The interactive online class is conducted through any learning management system(LMS), students interact with teacher during the class, all learning material, assignments etc are shared through the LMS.

(B) Semi-off-line Mode: Learning in this mode is being facilitated **for students who have problems with internet connectivity or bandwidth** and hence who can't attend scheduled classes.

- Classes are recorded and uploaded on Youtube/google drive with link on MOODLE.
- The students, who don't have continuous access or bandwidth to attend all scheduled classes, can download the video lectures/demonstrations/ simulations/other learning material/ assignments etc.
- The students send their queries/assignments through e-mails or what's app to the teachers.
- Once a week an on-line interactive additional class is scheduled for explaining concepts and answering students' queries.
- Question-answer model will be used. Along with notes faculty is providing solutions of assignments.

(C) Continuous Assessment of Theory & Laboratory Sessions

To keep track of student learning and to keep students engaged and interested in the online education being imparted the following assessment schedule was implemented for both synchronous & asynchronous learners.

Assessment of Theory:

- Minimum 01 short quiz per course per week as scheduled by teacher
- Minimum 01 short assignments per week (hand written)
- Mid-semester exams: 02 (average score)
- Group project & presentation (twice in semester)
- Course end seminar (01)

Assessment of Practical Component:

- Submission of hand written/typed lab report after each class
- Minimum 01 short practical quiz per course per week as scheduled by teacher
- Minimum 01 internal vivas per month as scheduled by the teacher (01 x number of weeks)
- Final internal viva (01)

5. Evidence of Success:

— MITS was the first institute to conduct classes in digital mode, very effectively, thanks to

the existence of MOODLE and the timely preparation of the "Digital Teaching-Learning Action Plan since 26th June 2020.

- Looking at the successful conduction of digital classes and virtual laboratories in the institute during the lockdown, the Directorate of Technical Education, Madhya Pradesh asked MITS demonstrate leadership by conducting virtual workshop, under IQAC, during 09th July to 11th July 2020 on "**Effective Use of e-learning Platforms for Teaching & e-contents Developments Tools**" for 1600 plus technical teachers of the state.
- This plan has been very successful in completing the syllabi and session on time.
- It has met the requirements of all kinds of learners and has permitted 'in your own time, at your own place, at your own pace' model of learning.
- Though online/digital education cannot replace conventional classroom teaching, it has many advantages; it has succeeded in generation of a large volume of digital content by the faculty, popularized MOOCs and encouraged our own MOOC development activity.
- The digital content generated is available at all times and easily augmentable.
- Audio, video and multimedia resources can be easily integrated
- The students were able to expand their intellectual horizon and devote energy in learning the use of tools and skills which may not have been possible in traditional teaching environment.

6. Problems Encountered and Resources Required:

FAQs were circulated

- Initially there were problems of bandwidth and data availability among some sections of students but slowly they became used to the asynchronous mode of learning and the continuous assessment and additional classes helped them in being with the class.
- The institute already had a digital recording studio in place and faculty were familiar with use of MOODLE and other online platforms.
- Pen-tablets, portable cameras and subscription of GOOGLE MEET and zoom was purchased.
- Initially students had lots of queries regarding live classes, excessive screen time etc. Counseling sessions were conducted by the class coordinators, all queries were compiled and FAQs were posted on website/MOODLE.
- After these initial hurdles, students appreciated the institute initiative of providing a transparent and effective T-L-E mechanism to ensure student learning during troubled times.

7. Notes (Optional)

The institute has identified portions of syllabi/courses which can be learnt easily in digital mode in future also. This classification has been integrated in the schemes and curriculum also and in future offline/online/blended all three modes will be indicated in the lecture plan.

The Digital Action Plane is available at:
https://www.mitsgwalior.in/login/upload/Digital%20Leraning%20Action%20Plan%202020.pdf

BEST PRACTICE-2

1. **Title: Development and implementation of the Flexible Curriculum**

2. **Objectives of the practice:** The objective of the development of the Flexible Curriculum was to

   - Provide students with an option to choose a percentage of their domain courses as per their career choice and interest
   - Provide option for selecting interdisciplinary courses as per their choice and inclination
   - Provide a chance for getting minor specialization in an allied discipline along with B.Tech in parent discipline
   - Provide a chance for getting an honours specialization in a sub-discipline parent discipline along with regular B.Tech degree
   - Provide a chance for the students to become self-learners by opting a few on-line courses for credit transfer through MOOCs
   - Provide opportunities for the students to become 'Job ready' through mandatory internships and industrial projects
   - Provide scope for professional development by assigning credits to achievements of extra & co-curricular activities for the holistic development

3. **The Context :**
   - In order to fulfil the need of producing graduates which will have interdisciplinary orientation and will have choice to pick courses as per their aptitude and career interest, the Flexible Curriculum was developed in 2017-2018.
   - This curriculum was modeled after the 'AICTE Model Curriculum 2018' and implemented w.e.f. Academic Year 2018-19 with provision for credit transfer through MOOCs.
   - The MITS faculty was working hard for developing a "Choice Based Credit System (CBCS)" since 2015-2016 which was later named as "Flexible Curriculum".
   - The idea was to fulfill the aspirations of our graduates by providing them choice and flexibility in learning and shaping their careers.

4. **The Practice :** The Flexible Curriculum was developed and approved by the Academic Council of the institute for implementation w.e.f. Academic Session 2018-19**.**

   - A committee was constituted for preparing the scheme and structure for the new flexible curriculum. Many reviews and workshops with representatives of stakeholders & Board of Studies Meetings were conducted and then placed in the Academic Council for approval in April/May 2018.
   - Detailed agenda for BoS meetings was drafted by the Academic Development Cell (ADC) and circulated to all departments for implementation.
   - Board of Studies meetings in September-October 2018 & February-March 2019 finalized syllabi, with COs & POs.
   - The DEs, OCs & MOOCs to be offered in the next semester are approved by the BoS in its meetings; For the latest July 2020-December 2020 these courses were approved by the Academic Council meeting on 15th June 2020**.**
   - A discussion & orientation session was conducted by the Academic Development Cell (ADC) with the faculty to brainstorm on the different provisions of this curriculum
   - The list of courses approved by BoS and Academic Council for getting an (i) Honours in parent discipline or (ii) Minor specialization in other allied engineering disciplines displayed on the institute website
   - The meeting of the BoS is twice a year for
     - Proposing departmental Electives/Open Elective courses
     - Approving electives from NPTEL/SWAYAM/MOOCs for credit transfer
     - Proposing list of additional courses under minor specialization in allied disciplines
     - Proposing list of additional courses for Honours in the parent discipline

Reviewing the Course Outcomes & their attainment and setting targets/corrective actions after gap analysis
- Revisions in courses
- Introduction of new courses as per the industry demand
- Introduction of courses – enhancing employability and skill
- Curricula feedback taken from all stakeholders

The salient features of the Flexible Curriculum are:

- *There is provision of about 13-14 core courses, about 5-6 electives, 05 open electives in addition to mandatory courses, science & humanity component for Engineering Programmes*
- *There is provision of additional courses equivalent to 20 credits for getting honours or minor specialization*
- *There is provision for three mandatory internships*
- *There is provision for MOOCs in each semester from III semester onwards*
- *For the award of Under Graduate Degree (UG) in Engineering/Technology & Architecture, it is required to earn minimum 160-170 & 260 Credits respectively.*
- *Students are eligible to get UG Degree with Honours or Minor Specialization (relating to other fields of Engineering, Technology, Applied Science, Management etc.), if they earn 20 & 24 extra credits (in addition to the compulsory credits required to obtain the B. Tech. & B. Architecture degrees respectively).*
- *These additional credits can be acquired through SWAYAM /NPTEL/MOOC platform based learning.*
- *There is a provision from 5th semester onwards for the desirous students to opt for additional courses in order to earn the 20/24 additional credits required for honours or minor specialization.*
- *Different Tracks of Specialization are created for the students, according to their interest & career focus, for selecting additional courses to get Honours or Minor Specialization.*
- ***Ethics, Environmental Science, Disaster Management, Intellectual Property Rights (IPR) and Cyber Security** are included as **Mandatory Courses (MC)** at appropriate places in the scheme.*
- *There are is provision for Mandatory Audit Courses; At present '**Biology for Engineers'** and '**Indian Constitution & Traditional Knowledge'** are being offered.*
- *Beginning with academic year 2018-19, there is an **Induction Programme** of **three (03) weeks duration** for the **First Year Students,** which will include- Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Department/Branch & Innovations, Foundation Courses etc. To accommodate for this activity at the beginning of the session, the credits of 1st & 2nd Semester have been kept at 21.*
- *One Credit' at the **8th semester** is allotted for 'Professional Development' to motivate, inspire and recognize student participation at National/ International level technical events during the entire tenure of the UG programme. The detailed guidelines for evaluation will be prepared in due course of time.*

Professional Development Course (PDC)

— *The guidelines for evaluation of the were already prepared with the other documents of the 'Flexible Curriculum'.*

— *The evaluation datasheet for PDC at the VIII semester were prepared, circulated and* implemented.

IN-HOUSE INTERNSHIP

— *The flexible curriculum has provision of **3 mandatory internships. Two internships are being***

conducted in-house and *one at a relevant industry during the summer vacations.*

S.No.	Detail	Hours	Year of Internship	Evaluation
1.	Summer Internship Project-I (Institute Level)	60 Hours	First Year	III Semester (02 Credits)
2.	Summer Internship Project-II (Soft Skills)	90 Hours	Second Year	V Semester (03 Credits)
3.	Summer Internship Project -III (On Job Training)	150 Hours	Third Year	VII Semester (02 Credits)

IN-HOUSE INTERNSHIP MODULES DEVELOPED/OFFERED DURING THE LAST 4-YEARS

Internship	2017-2018	2018-2019	2019-2020	2020-2021
SIP-I	484 students (42 Modules)	874 Students (36 Modules)	953 Students (33 Modules)	1068 Students (29 Modules)
SIP-II	---	451 Students (Soft-skills Module)	980 Students (Soft-skills Module)	1045 Students (07 Modules)
Finishing School	---	--	731 students (15 Modules)	893 students (16 Modules)

FULL SEMESTER INTERNSHIP (Final Semester)

- *The provision of internship for the full duration of the 8th semester has started for the 2017-18 admitted batch.*
- *To draft a clear policy and guidelines for the same a committee was constituted.*
- **The draft policy was prepared and reviewed by the SDC, ADC and IQAC. The key points include:**
  - *One mentor to be approved from concerned industry, one from institute*
  - *Weekly attendance to be forwarded by external mentor to institute mentor*
  - *Mid-semester exam to be permitted on MOODLE*
  - *About Five numbers of quiz to be conducted in each course on MOODLE*
  - *Assignments to be submitted every week on MOODLE*
  - *Presentations (in group) on each unit to be facilitated through skype*

The rough scheme and structure is presented below

Approved Structure of Undergraduate Engineering Program (2017-2018 to 2019-2020 admitted batches)

S.No.	Category	Suggested Breakup of Credits by AICTE	Component wise credit allotment**	No. of Courses	Weightage (Percentage)
1	Humanities and Social Sciences including Management Courses (HSMC)	12**	12	04	7
2	Basic Science Courses (BSC)	25**	20	05	11.7

3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc. (ESC)	24**	21	06	12.3
4	Departmental Core Courses (DC)	48**	52	13	30.6
5	Departmental Elective Courses relevant to specialization/branch (DE)	18**	20	06	11.8
6	Open Category- Electives from other technical and /or emerging subjects (OC)	18**	15	05	8.9
7	Project work, seminar and internship in industry or appropriate work place/ academic and research institutions. (DLC/SWAYAM/NPTEL/MOOC)	15**	22	13	13
8	Mandatory Course (MC)	-	08	03	4.7
	Total	160**	170	55	100

****Discipline specific minor variations possible**

5. Evidence of Success:

- Flexible curriculum, based on the AICTE Model Curriculum-2018 was implemented in the institute w.e.f July 2018 for the 2017-2018 admitted batch.
- One cycle of flexible curriculum is now about to complete with the graduation of the 2017-2018 admitted batch in June 2021.
- The provision of 'Credit transfer from MOOCs was implemented w.e.f. 2017-18 admitted batch, from V semester for minors/honours cases, i.e. since July-December 2019.
- Since then, two batches 2017-18 admitted and 2018-19 admitted have been benefitted by this. The total credits transferred is shown below in the table.

Summary of No. of Credits Earned through MOOCs

BRANCH	2017 ADMITTED STUDENTS			2018 ADMITTED STUDENTS			TOTAL
	J.20	D.20	J.21	J.20	D.20	J.21	
Automobile Engineering	100	70	174	4	-	250	**598**
Biotechnology	34	28	48	-	-	36	**146**
Civil Engineering	196	136	370	50	10	160	**922**
Chemical Engineering	94	92	188	6	6	20	**406**
Computer Science & Engineering	214	178	416	46	26	82	**962**
Electronics Engineering	218	180	364	18	6	484	**1270**
Electrical Engineering	200	186	398	40	30	608	**1462**
Electronics & Telecommunication	108	88	154	-	-	232	**582**
Information Technology	110	90	188	16	16	24	**444**
Mechanical Engineering	196	180	364	42	38	486	**1306**
TOTAL	**1470**	**1228**	**2664**	**222**	**132**	**2382**	**8098**

— For the first time in the state of Madhya Pradesh, under the Flexible Curriculum, Minors/Honors degrees are awarded to students of the 2017-2021 batch, details below.

ADDITIONAL MINOR SPECIALIZATION IN ALLIED BRANCH
&
HONORS DEGREES IN PARENT BRANCH
AWARDED ALONG
WITH
B.Tech IN PARENT ENGINEERING DISCIPLINE

Degree/Specialization	No. of students	Branch-wise Break-up
B.Tech Degree with Minor Specialization in CSE	11 students	ME: 03, AU: 02, EC: 02 , ET:02, BT:02
B.Tech Degree with Honors	25 Students	ME:13, AU:01, IT:02, EE: 04, EC: 01, CSE:03, ET:01

6. Problems Encountered and Resources Required:

— The Flexible Curriculum is not implemented in any of the technical institutes/universities of the state of Madhya Pradesh.
— MITS is an autonomous institute under UGC and has academic autonomy from the state technical university, RGPV, Bhopal.
— The institute had to conduct a large number of meetings pre and post Academic Council since 2018 in order to get the Flexible Curriculum approved by the university so that degrees can be awarded to eligible students.
— Students had large number of queries regarding the elective courses (DEs & OCs), provision of Minor Specialization & Honors and mandatory credits from MOOCs.
— Due to COVID and two lockdowns, sometimes the students could not appear for the proctored examinations of the mandatory MOOCs. The institute then provided alternate solution for the same, under the provisions of the SWAYAM-NPTEL
— The administration, class coordinators and Heads of Departments organized many orientation sessions, counselling sessions and open houses for motivating the students and creating awareness about the Flexible Curriculum.
— However, the efforts succeeded and students took advantage of the provisions of flexible curriculum.

7. Notes (Optional)

— The Flexible Curriculum was implemented w.e.f from 2018-19 to the batch of students who were admitted in 2017-18.
— Since then, every year, as the batch moved from II year to IV year, new provisions of the 'Flexible Curriculum' came into existence and detailed guidelines were prepared for the smooth implementation of these provisions, each year.
— The Flexible Curriculum has completed one full round now successfully and since 2020-2021 admitted batch, some of the NEP-2020 concepts are also integrated in this curriculum.