University of Mumbai

No. UG/ 19 of 2021

CIRCULAR:-

Attention of the Principals of the Affiliated Colleges, The Head of the University Department of Theatre Arts and Directors of the recognized Institutions in Faculty of Humanities.

They are hereby informed that the recommendations made by the Ad-hoc Board of Studies in **Theatre Arts** at its meeting held on 20th November, 2019 **vide** item No. **1(o)** and subsequently passed by the Board of Deans at its meeting held on 5th December, 2019 **vide** item No. **30** have been accepted by the Academic Council at its meeting held on 23rd February, 2021 **vide** item No. **4.18** and subsequently approved by the Management Council at its meeting held on 9th April, 2021 **vide** item No. **15** and that in accordance therewith, in exercise of the powers conferred upon the Management Council under Section 74(4) of the Maharashtra Public Universities Act, 2016 (Mah. Act No. VI of 2017) the Ordinance **6550 & 6551** Regulations **9296 & 9297** and the syllabus of **Diploma in Sound Recording & Designing (DISRD)** has been introduced and the same have been brought into force with effect from the academic year **2020-21**. (The said course might be introduced from the academic year 2021-2022 in the wake of prolonged Covid-19 pandemic situation in the country) accordingly. (The same is available on the University's website www.mu.ac.in).

(Dr. B.N. Gaikwad)
I/c. REGISTRAR

MUMBAI – 400 032
1st June, 2021
To ,

The Principals of the Affiliated Colleges, The Head of the University Department of Theatre Arts and Directors of the recognized Institutions in Faculty of Humanities. (Circular No. UG/334 of 2017-18 dated 9th January, 2018.)

A.C/4.18/23/02/2021
M.C/15/9/04/2021

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No. UG/ 19A of 2021 MUMBAI-400 032 1st June, 2021

Copy forwarded with Compliments for information to:-

1) The Chairman, Board of Deans
2) The Dean Faculty of Humanities,
3) The Chairman, Ad-hoc Board of Studies in Theatre Arts,
4) The Director, Board of Examinations and Evaluation,
5) The Director, Board of Students Development,
6) The Co-ordinator, University Computerization Centre,

(Dr. B.N.Gaikwad)
I/c. REGISTRAR

Copy to :-

1. **The Deputy Registrar, Academic Authorities Meetings and Services (AAMS),**
2. **The Deputy Registrar, College Affiliations & Development Department (CAD),**
3. **The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Department (AEM),**
4. **The Deputy Registrar, Research Administration & Promotion Cell (RAPC),**
5. **The Deputy Registrar, Executive Authorities Section (EA),**
6. **The Deputy Registrar, PRO, Fort, (Publication Section),**
7. **The Deputy Registrar, (Special Cell),**
8. **The Deputy Registrar, Fort/ Vidyanagari Administration Department (FAD) (VAD), Record Section,**
9. **The Director, Institute of Distance and Open Learning (IDOL Admin), Vidyanagari,**

They are requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to in the above circular and that on separate Action Taken Report will be sent in this connection.

1. **P.A to Hon'ble Vice-Chancellor,**
2. **P.A Pro-Vice-Chancellor,**
3. **P.A to Registrar,**
4. **All Deans of all Faculties,**
5. **P.A to Finance & Account Officers, (F.& A.O),**
6. **P.A to Director, Board of Examinations and Evaluation,**
7. **P.A to Director, Innovation, Incubation and Linkages,**
8. **P.A to Director, Board of Lifelong Learning and Extension (BLLE),**
9. **The Director, Dept. of Information and Communication Technology (DICT) (CCF & UCC), Vidyanagari,**
10. **The Director of Board of Student Development,**
11. **The Director, Department of Students Walfare (DSD),**
12. **All Deputy Registrar, Examination House,**
13. **The Deputy Registrars, Finance & Accounts Section,**
14. **The Assistant Registrar, Administrative sub-Campus Thane,**
15. **The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan,**
16. **The Assistant Registrar, Ratnagiri sub-centre, Ratnagiri,**
17. **The Assistant Registrar, Constituent Colleges Unit,**
18. **BUCTU,**
19. **The Receptionist,**
20. **The Telephone Operator,**
21. **The Secretary MUASA**

for information.

(Appendix 'B')

New Ordinances 6550 & 6551 relating to
the Diploma in Sound Recording & Designing (DISRD)

1. **Necessity of starting Diploma in Sound Recording & Designing (DISRD) course:**
India has witnessed the emergence of various new-age courses that are gathering momentum, as students increasingly pursue courses that fuel their passion and open up job opportunities. A recent demand for educated and qualified professionals was discovered in the field of Sound Recording & Designing. Even the world is looking closely at Indian Sound Recording & Designing professionals for different Programmes, Movies, Newsreels, Commercials, Music videos, Documentaries, etc. leading to rising employment opportunities for professionals. Further to highlight that due to the extensive presence of the Film, Entertainment & Television industry in Mumbai, it's been considered as capital for it, making it a preferred destination for professional education in this sector. University of Mumbai by offering structured course for this Industry shall open up opportunities for multiple aspiring students to pursue their career in this rising sector.

2. **Whether UGC has recommended to start the said Course:**
The basis to start the course is our indegenious understanding about its requirement and not primarily as per the recommendation from UGC.

3. **Whether the course have commenced from the academic year 2019-20:**
Diploma in Sound Recording & Designing (DISRD) course is now planned to start from next academic year 2021-22.

4. **The courses started by University are Self-Financed, whether adequate number of eligible permanent Faculties are available:**
Diploma in Sound Recording & Designing (DISRD) course is planned to start from the academic year 2021-22 and the identification and appointment of Eligible Faculties is under progress.

5. **To give details regarding duration Diploma in Sound Recording & Designing (DISRD) course and is it possible to compress the Course:**
The duration of the Course is for 1 year which is taken-up after considering the optimal duration needed to complete the syllabus requirement of the course.

6. **The intake capacity of Diploma in Sound Recording & Designing (DISRD) course and no. of admissions given in the current academic year (2019-20):**
The course is to start from the academic year 2021-22 and hence admissions has still not started. The Intake of this course is 60 students.

7. **Opportunities of Employability / Employment available after undertaking Diploma in Sound Recording & Designing (DISRD) course:**
The training methodology of the course has a high emphasis on the industry oriented approach. Students are to be part of live projects, internships and other extracurricular activities with the Industry during their educational journey to ensure their industry readiness. Along with the collaborations and associations with key industry practitioners, a dedicated placement cell will facilitate different forms of employment opportunities for the students. In the growth of the Film & Entertainment sector in India, Mumbai city has played a significant role in the past century. It houses many of the leading corporates, production houses and organisations of this Industry, opening the untapped employment opportunities for learned professionals, undertaking such courses recognised by the University of Mumbai department.

Diploma In Sound Recording & Designing

O.6550	**Title of the Course**	**Diploma In Sound Recording & Designing**
O.6551	**Eligibility for Admission**	**Have passed 10+2 / HSC examinations from any stream;**
R.9296	**Passing Marks**	**40% passing marks**
	Ordinances / Regulations (if any)	**As attached**
	No. of Years / Semesters	**1 year full time/ 2 semesters**
	Level	**Diploma**
	Pattern	**Semester**
	Status	**New**
	To be implemented from Academic Year	**From academic year 2020-21**
R.9297	**Intake Capacity**	**60**

Objectives of Diploma In Sound Recording & Designing

The course covers all the relevant building blocks of sound design. It enables students to explore the nature of current sound and music technologies, using the latest digital audio hardware, software and programming packages. Students will investigate topics such as sampling, sequencing, mixing, remixing, signal processing, sound editing and recording, alongside audio programming, internet audio and electronics, ensuring that they will be well equipped with the knowledge and hands-on experience expected of today's professionals.

Course Objective

This course will enable students to:

- Immerse themselves in the study of music, sound and technology.
- Develop up-to-date technical skills in digital and audio technologies.
- Acquire imaginative strategies for producing creative and technical work, involving experimentation, speculation and rigorous investigation.
- Learn how to interpret and understand music and sound in a variety of cultural and interdisciplinary contexts.
- Develop highly transferable skills, such as creative innovation, written and oral communication.
- Become equipped to make a significant and valuable contribution to the fields of audio production, composition, media, education and other areas of the cultural and creative industries.

R – Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment & Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 24 out of 60) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 16 Out of 40) separately. A learner will be said to have passed the course if the learner passes the Internal Assessment & Semester End Examination together.

Marks	Grade Points	Grade	Performance
Less than 40	0	F	Fail
40 - 44.99	4	D	Pass
45 - 49.99	5	C	Average
50 - 54.99	6	B	Above Average
55 - 59.99	7	B+	Good
60 - 69.99	8	A	Very Good
70 - 79.99	9	A+	Excellent
80 & Above	10	O	Outstanding

R - Credit Based Evaluation System Scheme of Examination

For all 6 semesters, the performance of the learners shall be evaluated into two components. The first component shall carry 40% marks which will be an internal assessment while the second component shall carry 60% marks at semester end examination.

The allocation of marks for the Internal Assessment 40% and Semester End Examinations 60% are as shown below:

a) **Structure of Internal Assessment - 60% = 60 marks**

Sr. No.	Particulars	Marks

1	One periodical class test held in the given semester	20 Marks
2	Subject specific Term Work Module/assessment modes – atleast two as decided by the department in the beginning of the semester (like Extension/field/experimental work, Short Quiz; Objective test, lab practical, open book test etc and written assignments, Case study, Projects, Posters and exhibits etc for which the assessment is to be based on class presentations wherever applicable) to be selflessly assessed by the teacher/s concerned	30 Marks
3	Active participation in routine class instructional deliveries (and in practical work, tutorial, field work etc as the case may be)	05 Marks
4	Overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic activities	05 Marks

b) **Semester End Examinations - 40% = 40 Marks**

i. Duration – These examinations shall be of 2 Hours duration.

ii. Theory Question Paper Pattern:

- Q1 - Answer in Brief (Any 5 out of 7) - 15 marks
- Q2 - Answer in detail (Any 3 out of 5) - 15 marks
- Q3 - Descriptive question/case study (Compulsory) - 8 marks

Question may be subdivided into sub-questions a, b, c… and the allocation of marks depends on the weight-age of the topic.

Course Structure

	DIPLOMA IN SOUND RECORDING & DESIGNING	**Credits**	**Internals**	**Externals**	**Total**

	SEMESTER I				
1.1	Audio and Video Production Techniques	4	60	40	100
1.2	Production & Post-Production Process	4	60	40	100
1.3	Sound Engineering Electronics I	4	60	40	100
1.4	Sound Recording Components & Techniques I	4	60	40	100
1.5	Practical Training & Project Report I	4	100	-	100
	TOTAL	**20**	**340**	**160**	**500**
	SEMESTER II				
2.1	Concepts of Sound Recording	4	60	40	100
2.2	Sound Recording Components & Techniques II	4	60	40	100
2.3	Creative Sound Recording	4	60	40	100
2.4	Sound Engineering Electronics II	4	60	40	100
2.5	Practical Training & Project Report II	4	100	-	100
	TOTAL	**20**	**340**	**160**	**500**

1.1 AUDIO AND VIDEO PRODUCTION TECHNIQUES

UNIT I

Sound waves – Types, Classification and quality – pitch, low and high frequency – Input transducers – Microphones – types of microphones – sensitivities of microphones – Output transducers –Loudspeaker – Mono – Stereo – panning, surround and filters – Perception of sound – wave length –Amplitude – Frequency – pitch – harmonics – equalization – reverberation time – basic set-up of recording system – analog, digital – cables and connectors.

UNIT II

Mixing console – Echo and reverberation – special effects units – equalizers and compressors- plugins – digital recording software – editing techniques – Input devices– storage – output devices – basics of broadcasting – AM, FM, mobile radio, internet radios, community radio, educational radio broadcasts – compression ratios – various sound file extensions – time code – synchronization –positioning of microphones – speech - musical instruments and mixing.

UNIT III

Introduction to digital video equipment's: digital video camera – types – format – major components – operation and functions – Lens – types – aperture – shutter – focusing methods – Focal length –depth of field – video signal – video format – video lights – types and functions – tripod– types – clapboard – usage – light meter – other useful accessories
.

UNIT IV

Introduction to digital video production: Digital camera – Movements – composition – shots – angles – Mise-enscene – Colour temperature – multi camera setup – Lighting – basic and special lighting setup – atmospheric lighting – ENG – Anchoring – Compeering – Montage – News documentary

UNIT V

Single Camera Production, Multi camera production – Documentary Production – Short Film Production – Electronic Field Production – Talk shows – Interviews the EDL – Dimensions of editing – spatial – Rhythmic – graphic – temporal editing – continuity editing – Dimensions of film sound – Voice over – Dubbing – Re-recording – Titling – Adding special effects.

REFERENCE BOOKS

1. Philip Newell, Elsivier. Recording studio design, Oxford, Focal Press. 2005 2. Strutt, John Williams, Baron. The Theory of sound Rayleigh 1996. 3. Fahy, Frank Foundations of Engineering Acoustics. Academic Press 2001. 4. Video Production Techniques – Zettl – 2002. 5. Television Production – Gerald Millerson, Focal Press, London, 1999. 6. The Techniques of Television Production - Gerald Millerson, Focal Press, London, 2001.

1.2 PRODUCTION & POST PRODUCTION PROCESS

UNIT : I

Basic requirements of Television Camera - Lens - Turret - Variable Focal Length Lens -Lens Controls - Focus ring - Zoom ring - Aperture ring - Macro ring - Flange Focus -Filter Wheel - Image sensor - Camera Tube - CCD - Signal Processing - Analogue andDigital Video signal - -Composite and Component Video signal - White and BlackBalance - Saturation and Pedestal Control - Gain Control - Menu Controls - Camera Supports.

UNIT : II

Sound Recording Techniques for Television - Understanding Sound - Frequency - Sound Reproduction - Microphone - Functioning of Microphone - Types of Microphone and their Application - Audio Mixing Console - Audio Sources - Analogue and Digital Audio Recording Instruments - Audio Sweetening Techniques - Audio layering - Mixing -audio Monitoring Devices - Acoustic Treatment for Recording Studio -

UNIT : III

Hard wares in Television - Camera and its Accessories - Camera Supports - Camera Control Unit -Vision Mixer - Special Effects Generator - Digital Video Effects Generator - Character Generator - Video Monitors - Intercommunication System - audio Monitor - Audio Mixing Console - Lighting control - Lighting Instruments - Video Tape Recorders -Telecine - Sync Generators - Teleprompters - Graphic Generators - Video Editing Systems - Linear and Non-Linear Video Editing Systems - Effective use of Hardware in Television Production - Co-ordination.

UNIT : IV

Television Programme Production - Planning - Selection of Concept -Scripting - Story board writing - Writing Shooting Script - Budgeting - Selection of Artist - Selection of Location - Production arrangements - Floor Plan - Set-designing and Construction of Sets - Lighting Plan - Placement of of Set-props - Rehearsal - Blocking - Preparing Camera card, Audio cue-sheet, VTR and Telecine cue-sheet - Preparation of Graphics -Dry Run-Recording - Television Programme Production Crew - Technical and Production Personnels - Duties and Responsibilities.

UNIT : V

Post Production Techniques - Video Editing - Linear and Non-Linear Editing - Cut to Cut Editing -A/B Roll Editing - Use of Special Video Effects Generator - Using Computers In Video Editing - Different Non -Linear Editing Software - Audio / Video Capture cards - Digitizing Techniques - Using compression during Capturing -Colour Correction - Technique of Non-Linear Editing - Using Videos/Audio layers - Use of Transition and Effects - Compositing - Modifying images - Editing and Exporting to MTape - Voice Dubbing - Effects Posting - Music Recording - Audio Layering - Mixing Techniques - Understanding Time-code-Time-code based Editing - Creating EDL - Off-line Editing.

REFERENCE:

1. The Complete Film Production Handbook- Honthaner, Eve Light
2. Video Production – Belavadi -Oxford

1.3 SOUND ENGINEERING ELECTRONICS - I

UNIT : I

Conductor and Insulators - Resistance Temperature co-efficient of resistance - ohm's law- Series and parallel resistance - Power and energy (electrical) - Capacitor - Unit of Capacitor - Types of capacitor - Break down voltage.

UNIT : II

Condensers in series and parallel capacitive reactors -Inductance -Inductive reactance - Impedance - Unit of Inductance - Permeability -inductance in series and parallel - Mutual Inductance.

UNIT : III

Transformer - Eddy currents and hysteresis - Time constant of RC circuits - Types of Transformers - Signal phase and three phases Voltage and Turns Ratio - Effect of secondary current.

UNIT : IV

Impedance matching - Transformers in Audio Amplifier Circuits Resonance - ,Q' of the coil.

UNIT : V

Semiconductor Theory - Current flow Holes - holes - Electrons - Junction Diode - Diode Action - Diode Characteristics - Zener Diodes - LED - Photo Diode.

REFERENCE:

1. Electronics fundamentals 7th Edition by Thomas L. Floyd(Maxwell Macmillan International Edition)
2. Basic Electronics - Devices, Circuites and Systems by Michael M.Girovle
3. Electronic Principles by Albert PoulMalvine.

1.4 SOUND RECORDING - COMPONENTS & TECHNIQUES - I

UNIT: I

Cables and Connectors / ConnectionsXLR, Phono, RCA, BNC, D-Sub, VGA, HDMI, Multicore, Two Core Shielded, Fiber Optic Cable.Hot, Cold, ShieldRecording Chain-Microphone to Speaker Introduction

UNIT: II

Basic acoustics- Reverb time, live room, dead room, sweet spot, resonance, controlling reverb time

Introduction to acoustic materials

UNIT: III MICROPHONES AND ACCESSORIES

1 Variety

- o Condenser microphone
- o Electret condenser microphone
- o Dynamic microphone
- o Ribbon Microphone
- o Carbon microphone
- o Piezoelectric microphone
- o Fiber optic microphone
- o Laser microphone
- o Liquid microphone
- o MEMS microphone

Stands, pop filter, spider suspender, parabolic reflector, wind shield.

UNIT IV WORKING PRINCIPLE OF MICROPHONE

Polar pattern -directional characteristics - cardiod, hyper cardiod, supercardiod, sub cardiodbi direction, omni direction, shot gun.Measuring polar response -off axis frequency response, proximity effect,microphone impedence, microphone sensitivity, balanced and unbalanced line, cause of distortion, overload in condenser and dynamicmicrophone.

UNIT V

Introduction to loud speaker - Working principles of loud speaker Components of loud speaker-cabinet, internal treatment of baffle, port hole, cone, spider, ring.Full range speaker, woofer, mid range speaker, tweeter, horns Cross over networkMulti speaker system -series and parallel connections Active and passive speakers.In phase and out of phase.

REFERENCE:

1. Recording Studio Handbook by John M. Woram
2. Modern Recording Techniques 7th Edition by David Miles Huber,Robert E. Runstein
3. Elements of Sound Recording by John J.C. Frayne and Wolfe
4. The Technique of Sound Studio by Alec Nisbett.
5. Principles of Digital Audio by Ken. C. Pohlmann.

2.1 CONCEPTS OF SOUND RECORDING

UNIT -I

Fundamental principles of variable density recording - light valve principles of variable area recording- types of variable area tracks - the aperture effect - galvanometer modulator - variable area lightvalve - optical schematics of variable area recording using light valve noise reduction to galvanometerimage growth and retraction of variable area recording - negative density - positive or print density

UNIT - II

Modulated high frequency recording (cross modulation analysis) as a means of Determining for optimum processing - sound track fog and its sources - significance of sound - track fog - wow and flutter - variable speed option D.C. serve motors.

UNIT - III

Noise and noise reduction principles - the nature of noise - white noise - pink noise - residual(quiescent) noise - signal-to-noise ratio - static and dynamic noise reduction - complementary devices(filters) static complementary devices (pre post emphasis) - dynamic non complementary devices(expanders) - dynamic complementary devices (compander) - tracking errors in noise reductionsystem.

UNIT - IV

Equalizers - low frequency equalization - the high pass filter - low frequency shelving equalization -mid-frequency equalization - composite equalization - parametric equalizers - Graphic equalizers -Band filter - Notch filters - Band-pass filters - effect of equalization on dynamic range - Equalizer phase shift Active and passive equalizer - Compressor, Limiter and Expanders.

UNIT - V

Gain riding Compressors and limiter - Definitions - Compressor - Limiter - Threshold - variable thresholds - the rotation point variable compression ratios - Pumping or Breathing - Release time -Attack time - Using the compressor for special effects - program limiting - stereo program limiting -The De-esser - Expand Threshold - The Noise gate - Multiband compressor.

REFERENCE BOOKS

1. Elements of Sound Recording - John J.C. Frayne and Wolfe.
2. The Recording Studio Hand Book - John M. Woram.
3. The Technique of Sound Studio - Alec Nisbett.
4. The Audio Encyclopedia - Howard M. Tramine.
5. Tape Recorder Servicing Mechanics -
6. Sound System Engineering - Don Davis and Carolyn Davis.
7. Audio System Design and Installation - Phillip Gidings.

2.2 SOUND RECORDING - COMPONENTS & TECHNIQUES - II

UNIT - I

Polar Patterns - Uni directional Microphones - Microphone with more than one polar pattern - - Single Pattern dual diaphragm microphone.

UNIT - II

Detailed theory in Analog & Digital mixing Consoles - Demonstration of the controls in the mixing console - Signal routing - Inputs - Outputs - Bus assignments - Monitoring - Automation - Wordclock - Timecode - Compressor/Limiter - Gate - Expander - Reverb - Delay.

UNIT - III

Introduction to PC & Mac - Intro to DAW - Plug-ins & Processors - Software's -DSP-PC & Mac Based Software's -Advantages/Disadvantages - MusicalInstruments - classification - Frequency & Dynamic range of musical instruments -Miking musical instruments - Frequency & Pickup of different types ofmicrophones.

UNIT - IV

Introduction to mono & stereo mixing - 5.1, 6.1, 7.1 Surround mixing - Introduction to DTS & Dolby.

UNIT - V

Introduction to sound negatives - Introduction & working principle of sound negative optical transfer unit - Different types of recordings done on sound negative - DTS & Dolby recording in sound negative - Introduction to sound positive & playback principles &equipments used.

Reference

1. Recording Studio Handbook by John M. Woram
2. Modern Recording Techniques 7th Edition by David Miles Huber, Robert E.Runstein
3. Micro Phons: Design and Applications by Liou Burroughs.
4. Acoustic design and Noise Control by Michael Rettinger

2.3 CREATIVE SOUND RECORDING

UNIT - I

Greatness and Power of Music - Basic technical terms - in music - Basic knowledge about the various instruments usedin, folk, Hindustani and Western Music - Elementary knowledge in writing musicalnotation.

UNIT - II

Microphone technique - sound localization - stereo microphone placement techniques – binauralrecording - the stereo microphone stereosonic recording - X-Y recording - M-S Recording - use ofadditional microphones - multi microphone placement techniques general rules - avoiding phasecancellations - Leakage minimizing techniques - Microphone placement for maximum separation -Using the Figure of 8 microphone - Acoustic separation - Isolation Booths, Baffles and GOBOES.

UNIT - III

Use of special purpose microphones - contact microphone - Lavalier microphones - Mixing variousmusical instruments. The electric guitar electronics keyboard instruments - The Leslie organ cabinet -percussion instruments - The Drum set - The piano-strings, brass and woodwinds - Signal processingdevices - Echo and reverberation - Definitions - Echo reverberation - Delay Decay - Room acoustics- Echo and Delay - The tape delay system. The digital delay line - The acoustic delaying - doubling -Reverberation and Decay - The reverberation plate - The spring reverberation system - Acoustic reverberation chambers - stereo reverberation - using stereo reverberation - The complete Echo -reverberation system

UNIT - IV

The modern recording studio console - The basic console - input section. Output section – Monitorsection - Echo send and return signal path summary of the signal path through the console – Monitorsection Recording technique - Overdubbing - The Sel-Sync process - Transferring of —Bouncing‖tracks. Transferring on to adjacent tracks - —Punching in‖ Remote control of the record/play backmode - The console in the Sel-Sync mode using the cue system - Headphone monitoring – Selectingheadphones - Track assignment - Bus/tape monitoring-preparing for the multi-track recording session- Seating plan - Microphone set up - Console preparation - Monitoring Using artificial reverberationduring recording - using other signal processing devices - Recorded levels - —Slating‖ End of
recording - The mix down session - Musical editing-splicing blocks - tracks editing – Trackassignment and panning - Preparing for mix down Assistance during mix down - Recording andmonitor levels - Monitor Speakers - The basic in-line recording console - input section of I/O module- output section of I/O module - The master module - The monitor module - The component parts of an in-line recording console.

UNIT - V

Simplified signal flow path through the in line console - Channel/line and reverse switches – Boardcast mode - Grouping - Group select switch - Monitor pan to channel buses - Monitor pan to sendbuses - Monitor mix - tu - cue - Wet switch - Mute switch - Solo in place - console module detaildrawings. Time code implementation - Recorded time data - The SMPTE time code - Frame ratesand application - Description of the code - SMPTE-assigned address bits - Time code address bits -Frame rate errors - Drop frame code bit - Colour frame code bit - Sync word bits-plus one frame - The complete SMPTE time code-User-assigned bits-Unassigned address bits - Bi-phase modulation - Time code generator - Time code reader-Video character generator - Jam sync-One time - Jam sync - continuous - Jam sync - copying time code - Regenerated time code - restored time code -Introduction to digital audio.

REFERENCE BOOKS:

1. Recording studio Hand book by John M. Woram.
2. Modern Recording Techniques 7th Edition by David Miles Huber.
3. Elements of sound Recording by J.C Frayne and Wolte.
4. The technique of sound studio by Alec Nisbett.
5. Principles of Digital Audio by Ken. C. Pohlmann.

2.4 SOUND ENGINEERING ELECTRONICS – II

UNIT : I

Rectifiers - Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Choke Input filter - RC filter - LC filter - Zener Voltage Regulator - Diode Clipper and Clamper.

UNIT : II

Transistors - Bi-Polar Transistor - NPN Transistor - PNP Transistor - Transistor biasing circuits - Base Bias - Voltage Divider Bias - Transistor Characteristics - Alpha and Beta of the transistors - Power Transistors.

UNIT : III

Amplifiers - Common Base Amplifier - Common Emitter Amplifier - Common collector Amplifier - Single Stage Amplifier - Two Stage RC Coupled Amplifier.

UNIT :IV

Class 'A' Amplifier - Class 'B' Amplifier - Phase Splitter - Non Linear distortion in Class 'A' - Transistor power rating - Thermal Resistance - Class 'B' push pull Amplifier - Basic Idea of a push pull Action - AC load line for Class 'B' - Cross over distortion.

UNIT : V

Setting up for the Q point - Voltage divider bias - Diode bias - Emitter Follower - Push pull power amplifier - Complimentary symmetry power amplifier - Transformer coupled push pull amplifier - Class 'C' amplifier.

REFERENCE:

1. Electronics Fundamentals 7th Edition by Thomas L. Floyd (MaxwellMacmillan International Edition)
2. Semiconductors from A to Z by Phillip Dallen

Practical Training & Project Report

Students will undertake a substantial piece of independent work, which

demonstrates an area of interest or specialism. Students will be given guidance throughout the academic year in order to help the student maintain sufficient progress to complete the project successfully.