

# University of Mumbai



No. UG/ 14 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 20<sup>th</sup> November, 2019 vide item No. **1(j)** and subsequently passed by the Board of Deans at its meeting held on 5<sup>th</sup> December, 2019 vide item No. **25** have been accepted by the Academic Council at its meeting held on 23<sup>rd</sup> February, 2021 vide item No. **4.13** and subsequently approved by the Management Council at its meeting held on 9<sup>th</sup> 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 **6540 & 6541** Regulations **9286 & 9287** and the syllabus of **Diploma in Cinematography (DIC)** 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](http://www.mu.ac.in)).

MUMBAI – 400 032  
1<sup>st</sup> June, 2021  
To,

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

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 9<sup>th</sup> January, 2018.)

A.C/4.13/23/02/2021  
M.C/15/9/04/2021

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No. UG/ 14<sup>A</sup> of 2021

MUMBAI-400 032

1<sup>st</sup> 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 Welfare (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.**

**New Ordinances 6540 & 6541 relating to  
the Diploma in Cinematography**

**1. Necessity of starting Diploma in Cinematography (DIC) course:**

In the recent past it has been observed that the new-age courses are gathering momentum, as students increasingly pursue courses that fuel their passion and open up job opportunities. A recent demand for educated and qualified personnel was discovered to cater to the flourishing Professional Film & Television Industry. Even the world is looking closely at Indian Cinematography sector for different Programmes, Serials, 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 & 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 indigenous 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 Cinematography (DIC) 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 Cinematography (DIC) 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 Cinematography (DIC) 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 Cinematography (DIC) 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 Cinematography (DIC) course:**

High emphasis is laid on the industry oriented approach in the training methodology of the course. 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 Cinematography 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 Cinematography**



<b><u>O. 6540</u></b>	<b>Title of the Course</b>	<b>Diploma In Cinematography</b>
<b><u>O.6541</u></b>	<b>Eligibility for Admission</b>	<b>Have passed 10+2 / HSC examinations from any stream;</b>
<b>R___</b>	<b>Passing Marks</b>	<b>40% passing marks</b>
	<b>Ordinances / Regulations (if any)</b>	<b>As attached</b>
<b><u>R.9286</u></b>	<b>No. of Years / Semesters</b>	<b>1 year full time/ 2 semesters</b>
	<b>Level</b>	<b>Diploma</b>
	<b>Pattern</b>	<b>Semester</b>
	<b>Status</b>	<b>New</b>
	<b>To be implemented from Academic Year</b>	<b>From academic year 2020-21</b>
<b><u>R.9287</u></b>	<b>Intake Capacity</b>	<b>60</b>

## **Objectives of Diploma In Cinematography**

This course aims to equip students with the competencies, tools and techniques required to work successfully as professional camera operators and cinematographers in the digital film and television industries.

### **Course Objective**

This course will enable students to:

- Demonstrate an understanding of the professional and technological determinants of cinematography for film and television;
- Demonstrate an advanced critical understanding of the processes involved with project management and self-directed planning in relation to their own work as well as in relation to any collaborative ventures undertaken
- Demonstrate capabilities of film and television production reflecting mastery of lighting and camera techniques.

### **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 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, 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

	<b><u>DIPLOMA IN CINEMATOGRAPHY</u></b>	<b><u>Credits</u></b>	<b><u>Internals</u></b>	<b><u>Externals</u></b>	<b><u>Total</u></b>
	<b>SEMESTER I</b>				
1.1	Dynamics of Visual Communication	4	60	40	100
1.2	Basics of Photography	4	60	40	100
1.3	Motion Picture & Camera Lenses I	4	60	40	100
1.4	Visual Effects in Cinematography	4	60	40	100
1.5	Practical Training & Project Report I	4	100	-	100
	<b>TOTAL</b>	<b>20</b>	<b>340</b>	<b>160</b>	<b>500</b>
	<b>SEMESTER II</b>				
2.1	Lighting & Imaging Technique of Cinematography I	4	60	40	100
2.2	Motion Picture & Camera Lenses II	4	60	40	100
2.3	Lighting & Imaging Technique of Cinematography II	4	60	40	100
2.4	Advance Aspects of Cinematography	4	60	40	100
2.5	Practical Training & Project Report II	4	100	-	100
	<b>TOTAL</b>	<b>20</b>	<b>340</b>	<b>160</b>	<b>500</b>

## **1.1 DYNAMICS OF VISUAL COMMUNICATION**

**UNIT I** Light and visual – Visualization process – Visual image – Principles of Colour: Psychology of colour, Colour theory and meanings – Sensual and perceptual theories – Attributes of visuals: Colour, Form, Depth and Movement.

**UNIT II** Visual language and culture – World culture, society and ethics, Understanding Popular Culture and Sub culture – Abstract thinking, Linear and lateral thinking – Holistic visual thinking.

**UNIT III** Visual media – Principles – Image and Imagination - Perspectives of visual images – Visual perception – Communication design, Graphic design and informational designs – Visual persuasion in various fields.

**UNIT IV** Introduction semiotics – Analysis - Aspects of signs and symbols – Sign and meanings –Description of signs – Denotations and connotations – Paradigmatic and syntagmatic aspects of signs – Signs and codes – reference systems – Audience interpretations.

**UNIT V** Visual perspectives and its special features: photography, motion picture, television, computer graphics, new media, World Wide Web.

### **REFERENCE BOOKS**

1. 1. Visual Communication – Images with messages 3rd Edition, Paul Martin Lester, Thomson Wadsworth, USA 2003. 2. Palmer, Frederic: Visual Elements of Art and Design, 1989, Longman. 3. Luin Annette, Power of the images, Rutledge and Kegan Paul, London 1985. 4. Nick Lacy, Images and Representation, Macmillan, London 1998. 5. John Fiske, Understanding Popular Culture, Unwin Hyman, London 1989. 6. PradeepManda. Visual Media Communication. Authors Press, New Delhi 2001.

## **1.2 BASICS OF PHOTOGRAPHY**

**UNIT I** Human Eye and Camera, Visual Perception, Basics of Camera (aperture, shutter speed, focal length, depth of Field etc.,) Camera operations- Types of Camera, Types of Lenses. characteristics and features of each type of cameras – Aperture - Shutter speed - Usage - Depth of Field - Focal Length - Basics of design - Photo composition - Rule of Thirds - Angle of View.

**UNIT II** Understanding Lighting- indoor and outdoor, Types of lighting, Natural and Artificial Lights, Exposure Meters, Differential focus, Filters, Flashes. Designing with light

**UNIT III** Types of Film- Sensitivity, Temperature, Speed etc., Reversal Films. Manipulation of Color and Light, Black and White and Colour Photography - Colour Processing and Printing

**UNIT IV** Equipments, Basic Requirements. Developing Process. Control Factors- Fixing, Washing, Drying. Negative (ideal, identifying faults). Printing (paper, chemicals, Enlarger) etc. Special effects techniques-motion pictures etc., manipulation of image, framing & trimming

**UNIT V** Aesthetics, Some Basic Principles. Basics of Photo-Journalism, Photo-features, Photo-essays, Writing captions, Visual story telling

### **REFERENCE BOOKS**

1. REFERENCE: 1. Michael Langford: Basic Photography, Focal Press. 2. Michael Langford: Advanced Photography, Focal Press. 3. Mitchell Bearley & John Hedgeese: New Introductory Photography Course, Read consumer Book Ltd. 4. 35 mm Photographer Hand book, Pan Book

## **1.3 MOTION PICTURE CAMERA AND LENSES – I**

### **UNIT - I**

Introduction to the Principles of Cinematography - Synopsis of motion - Tools of motion picture Camera work - Essential parts of motion picture camera -Working algorithm of motion picture camera - Mechanical parts of motion picture camera - Functions of various parts.

### **UNIT - II**

Study of lens - Study of lens systems - study of lens formats - Relation between film format and lens systems - study of film format and lens systems- study of film loading systems - Magazines - Single chamber, Double chamber & Co-axial magazines - Shutter system - Working principles of various types of shutters - Camera speed - Types of lens mounts - Matte box.

### **UNIT - III**

Transport mechanism - Intermittent mechanism - Frame rates - Shutter speed calculation - Shutter angle - Various types of motors - Claw mechanism -Types of claws - Picture gate and pressure plate - Tacho meter - Comparison between human eye and brain combination - Film and Camera Combination -The factors responsible for visual attention to the audience.

### **UNIT - IV**

Film Formats -Study of 8mm cameras - Study of 16mm cameras - study of super 16 cameras- 35mm format cameras - Anamorphic system - wide screen system - 70mm cameras - Super 35mm system.

### **UNIT - V**

Importance of the quality of a motion picture camera lens - Lens elements - Image formation with positive lens -Negative lenses - Image formation with cinematographic lens - Block lenses - Variable focal length lenses - Breathing effect - Advantages and Disadvantages of block and zoom lenses.

### **REFERENCES:**

1. Cinematography by Kris. Malkiewicz
2. Practical Cinematography by Paul Wheeler
3. Sight Sound and Motion by Herbert Zettl
4. American cinematographer manual 9<sup>th</sup> Edition.

## **1.4 VISUAL EFFECTS IN CINEMATOGRAPHY**

### **UNIT - I**

Introduction to special effects cinematography - In camera special processes - Special effects through variation in camera speed - Reverse shots - Technique of shooting with variation in shutter angle -dissolves - Fade-in and Fade-out - Ramping - Skip effect - Technique of shooting glass shots -Mirrors shots - Mask Frames - Double exposure - Miniature shots - Stop block technique.

### **UNIT - II**

Introduction to special effects with the combination of camera and lab - Study of traveling matte cinematography - Blue screen - Rotoscopy - Study of the special effects created by an optical printer- Double exposure - Matte - Titling - Fade-in - Fade-out - Dissolves - Freeze effects - Reduction and Blow ups - Introduction to image manipulation techniques in a motion picture lab - Silver retention processes - Technicolor's ENR process - Deluxe's CCE & ACE processes - Bleach by-pass techniques - Silver tint process - Cross processing - Stripping of anti-halation technique.

### **UNIT - III**

Introduction to Computer Generated Imagery - A brief study of Cine-on process - Animation films through computers - Various computer graphic effects - Morphing - Image manipulation through computers - The process of digital cinematography from subject to the projected image - Concepts of Tele-cine and Reverse Tele-cine processes - Introduction to digital cinematography - A brief study of the essential features of a digital broadcast camera - Facilities available for a cinematographer in a digital camera - Different types of digital formats such as DV, DV Cams, DVC Pro formats -Introduction to High Definition TV system.

### **UNIT - IV**

Introduction to special types of cinematography - 3 D Cinematography - Underwater cinematography- Aerial image cinematography - high Speed Cinematography - Time Slicing technique - I-max system - Time lapse cinematography - A brief study about the front projection system - Back projection systems - Motion control cinematography - Special effects through lenses and filters -Advantages and disadvantages of shooting films for blow-ups.

### **UNIT -V**

Introduction to Widescreen Cinematography - Types of widescreen cinematography - Mask frame widescreen cinematography - The advantages and disadvantages of different formats of mask frame techniques - Super 35mm format - Advantages and Disadvantages - Anamorphic cinematography -The concepts - advantages and disadvantages of cinemascope format over other 35mm wide screen systems - Techniscope system - Horizontal frame cinematography - Vista vision - Technirama - Advantages and disadvantages of the systems - Introduction to wide gauge cinematography - Various large format system - 70mm projection - Ultra panavision projections - Multiple film projection systems - Cinerama.

**REFERENCES:**

1. Filming the Fantastic: A Guide to Visual Effects Cinematography, Second Edition by Mark Sawicki
2. Compositing Visual Effects, Second Edition by Steve Wright
3. The VES Handbook of Visual Effects by Jeffrey A. Okun and Susan Zwerman
4. Digital Compositing for Film and Video, Third Edition by Steve Wright
5. VFX Artistry by Spencer Drate and Judith Salavetz

## **2.1 LIGHT AND IMAGING TECHNIQUES OF CINEMATOGRAPHY - I**

### **UNIT - I**

Introduction to the glory of light - Light is more than mere illumination -What light does - Propagation of light and its importance in Cinematography-Reflection - Refraction - Reflection factors of various material - Black - White-Black body - Attributes of light.

### **UNIT : II**

Nature of light - Light Intensity - The color quality - The light dispersion -light directionUnits of light Intensity Soft light and hard light -Advantages of hard and soft lights - Disadvantages of hard and soft lights -Sudden fall off - Gradual fall off - Direction of light - Diffusing a hard light -Shadows - shadows in relation to hard and soft light sources - Introduction to color temperature.

### **UNIT : III**

Natural light sources - Artificial light sources - Characteristics of natural and artificial light sources - Photographic light sources - Electromagnetic spectrum- Continuous and discontinuous spectrum - Incandescent lights - Tungsten lights - Halogen light sources - The concept of small and large light sources -Fresnel spot lamps - Open face lamps - Gas discharge lamps - The concepts of metal iodide lamps - HMI lamps - Importance of ballast in HMI lamps - HMI lamps and filming speed - Carbon arc lamps - Clusters - PAR lamps - Modern technology lamps - Lighting accessories - Diffusers - Nets - Gauss - Barn doors - Reflectors - Dimmers - Scrims.

### **UNIT : IV**

Exposure - Setting exposure - Over and under exposure - Exposure and color- Exposure and Camera speed - Exposure and shutter angle - Exposure and movement - Exposure and contrast - The concept of flashing - Exposure latitude - H & D curve - The law of reciprocity failure - Density - Camera -Types of films available - Day light and Tungsten balanced films - Working with Day lights on Tungsten balanced film - Working with Tungsten lights on Daylight balanced film.

### **UNIT :V**

Intensity of light - Foot candle - Lux - Measuring the intensity of the lights -Exposure meters Incident light meter - Reflected light meter - Advantages and disadvantages of incident light metering - Advantages and disadvantages reflected light metering - Grey card - Metering methods - Calculating a correct exposure using light meters

### **REFERENCES:**

1. Painting with light by John Alton
2. Reflections by Benjamin Berger
3. Lighting for film & Electronic cinematography by Dave Viera, Maria Viera





## **2.2 MOTION PICTURE CAMERA AND LENSES - II**

### **UNIT: I**

Factors responsible for the quality image reproduction of a lens system - Resolution of a lens system - Contrast of a lens system - Sharpness and Definition of lens system - Color reproduction of lens system.

### **UNIT : II**

Colour coating in a lens - lens glare and flare - Magnification of lens - Factors responsible for magnification and image size - Object distance and magnification - Focal length and magnification - Depth of field - Depth of focus - Focal plane and flange focal distance - Factors responsible for depth of field - Hyper focal distance - Focal length and it's relativity other technical aspects - speed of a lens - circle of confusion - Angle of view- Angle of coverage.

### **UNIT : III**

Different types of lenses used in Cinematography - Study of normal lens - Wide angle lens and it's effects - Study of a telephoto lens - Depth of field in relation with these lenses - Perspective - Use - Applications.

### **UNIT: IV**

Construction and complications of zoom lenses - Psychological effect of lenses - Special purpose lenses - Fish eye lenses - Dlopter lenses - anamorphic lenses - Lens defects -Prime lens Over zoom lens - Variable primer - Testing a lens - modern lens systems and manufactures.

### **UNIT: V**

Aberrations - Spherical aberrations - Astigmatism - Coma - Diffraction - Pincushion - Barrel distortion - Eradication of lens defects - Optimum aperture of a lens - Critical aperture of a lens - Lens charts.

### **REFERENCES:**

1. The Professional Cameraman's hand book. 4<sup>th</sup> Edition by Sylvia E Carlson, VerneCarlson
2. Photographic Lenses by Ernest Wildi
3. The Optics of Photography and Photographic Lenses by John Traill Taylor
4. Circles of Confusions: Film Photography by Hollis Frampton

## **2.3 LIGHT AND IMAGING TECHNIQUES OF CINEMATOGRAPHY - II**

### **UNIT : I**

Introduction to the concept of lighting for cinematography aims of lighting - Good lighting and bad lighting - Position of lights and it's effects - Lighting terms - lighting a flat surface - Lighting on object - Understanding the color and tones in relation lighting psychology.

### **UNIT : II**

Three point lighting - Four point lighting - Half lighting - High key lighting - Low key lighting - Cameo lighting - Limbo lighting - Rembrant - lighting - Chromo key lighting - Large scale lighting - Moon light setup - Day for high effect - Set lighting modern methodology in lighting - Cinematography styles - Developing a style.

### **UNIT : III**

Special Purpose Lighting -Fire - sets and mystery - Lighting for lighting camp fire scene - Candle flame - Lighting on rain - summer moon light - Dream lighting Tents - Transparency lighting - Exposing a light source - Ring lighting - Lighting for high speed cinematography - lighting for single frame animation - Time slice cinematography time lapse cinematography - Visual symphony.

### **UNIT : IV**

Filters - Glass filters - Gelatin filters - Sandwich filters - Advantages and disadvantages of each (material) filters over another - Filter factor compensation - Block and White filters - Filters for color cinematography - Color correction and conversation filters - General purpose filters - ND filters - Graduated filters - Polarizers - filter care - Creative use of filters.

### **UNIT : V**

Study of cinematographers and their styles - Hollywood, European cinematographers -Cinematographers of other countries - contemporary Indian cinematographers.  
Elements of electricity - Electrical units AC / DC - Circuits - Fuses and circuit breakers - Resistance - Voltage drop - Color temperature and voltage - Dimmers - Cables and connectors -Generators - Power consumption calculation for lighting - safety measures for huge sets - Heat, electricity and lights.

### **REFERENCES:**

1. Cinematography: Theory and Practice: Image Making for Cinematographers and Directors, by Blain Brown
2. Lighting for Cinematography: A Practical Guide to the Art and Craft of Lighting for the Moving Image (The CineTech Guides to the Film Crafts)

## **2.4 ADVANCED ASPECTS OF CINEMATOGRAPHY**

### **UNIT - I**

Introduction to the advanced models of motion picture cameras - Brief study of Arriflex BL cameras - Arriflex 435 cameras - Arriflex 765 camera - Arriflex 535 & 535B cameras - Panavision 65 camera - Panaflex 35 cameras - Vista vision cameras - Photo Sonics Action master 500 camera - A brief study about the special nature and application of these cameras - A brief study of 3 D cinematography - The aspect ratios of all the systems. The advantages and disadvantages of blow-up concepts - technical approach for working films for blow-ups.

### **UNIT - II**

Introduction to modern cinematographic light sources - Metal iodine lamps - HMI lights – HMI flicker problems - flicker free HMI lights - Study of soft sun lights - Study of fluorescent light sources - kin-o-flo - Technique of working with fluorescent light sources for motion pictures - Mercury vapor lamps - Sodium vapor lamps - Study of unconventional light sources such as laser lights - Computer controlled light systems - Black lighting - UV lighting and IR lighting - non photographic light sources such as domestic tungsten and fluorescent tube lights - Follow spots - Effects/Pattern projecting lamps - Techniques of working with unconventional light sources and non-photographic light sources.

### **UNIT – III**

Advanced lighting approaches - Light is more than illumination - Using lighting to play active and passive part - Lighting continuity for visual matching - Lighting shiny objects - Lighting matte objects - Lighting semi-matte objects - Lighting for transparency - Fantasy lighting - Introduction to pictorial lighting styles such as Notion - silhouette - Chair-o-scuro, Cameo - Limbo and Rembrandt lighting - Lighting for form - Lighting for color - Use of colored lighting for effects - Lighting techniques for creating - Animated lighting - Lighting with Ultra violet sources - Lighting with infrared light sources - Lighting for night in exterior - Day for night shooting techniques - Technique of lighting different types of human faces - Magic hour and twill light shooting - Sun rise and sun set shooting - Lighting for process shots - Lighting involving practical lamps in the frame - Lighting for skin tones - Lightning effects - Technique of lighting for rain sequences - Available light shooting techniques.

### **UNIT - IV**

Introduction to choices of lenses for cinematography - Creative use of Cinematographic lenses - Special purpose lenses - Reasons for working for a constant depth of field - Technique of working with variation in depth - Different types of lens construction - normal lens construction - Retrofocus lenses - Telephoto lenses - Reasons for the superiority of prime lenses over zoom lenses - The concept of variable prime lenses - Care of lenses - Introduction to advanced camera movement and camera support systems - Cranes - Remote controlled camera heads - Mobile cranes - Camera stabilizing systems - Study of a Steadicam system.

## **UNIT - V**

Introduction to the advanced models of broadcast video cameras - study of a Betacam camera and its accessories - Features available in a Betacam camera for a cameraman - Formats of Betacam - Working for a satellite news channel - Technique of working for ENG and EFP - Introduction to Digital Cinematography - Working for music albums - Working for commercials - Shooting film for TV broadcast - Comparative study of advantages and disadvantages of analogue system Vs Digital system - Comparative study of advantages and disadvantages of Digital system Vs Film.

### **REFERENCE:**

1. Video Shooter, Second Edition by Barry Braverman
2. High Definition Cinematography, Third Edition by Paul Wheeler

## **2.5 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.