



Deccan Education Society's
Fergusson College (Autonomous)
Pune

Learning Outcomes-Based Curriculum
for
S. Y. B. Sc.
Photography and Audio Visual Production
(Vocational)

With effect from June 2020

Programme Structure

| Year | Paper Code | Title of Paper | No. of Credits |
|--------------|---------------------|---|----------------|
| S. Y. B. Sc. | Semester III | | |
| | VPH2301 | Advanced Photography | 2 |
| | VPH2302 | Acoustics and Sound for Media | 2 |
| | VPH2303 | Practical Course - III | 2 |
| | Semester IV | | |
| | VPH2401 | Colour Theory & Digital Photography | 2 |
| | VPH2402 | Principles and Applications of Analog & Digital Communication | 2 |
| | VPH2403 | Practical Course - IV | 2 |

S.Y. B.Sc. Semester III

| | | |
|---|--|-------------------------------|
| Title of the Course and Course Code | Advanced Photography (VPH2301) | Number of Credits : 02 |
| Course Outcomes (COs) On completion of the course, the students will be able to: | | |
| CO1 | Identify different photographic accessories. | |
| CO2 | Explain the science and technology behind photographic equipment. | |
| CO3 | Carry out a photographic assignment using suitable photographic equipment and accessories. | |
| CO4 | Analyze light and other equipment for a photoshoot. | |
| CO5 | Evaluate the available / arranged lighting and arrange the lighting suitable for given assignment. | |
| CO6 | Arrange light and other equipment for a photoshoot. | |

| Unit. No. | Title of Unit and Contents | No. of Lectures |
|------------------|--|------------------------|
| I | Camera Lens: Optical materials, Plastics/ Glass, Lens coating, Types of lenses: Normal, Wide angle, Telephoto, Teleconverter, Fish eye lens, Zoom lens, Micro lens, Macro lens, Supplementary lenses-Close up lens, Extension tubes and bellows. Camera lens designs, Faults in lenses, Aberrations, Resolution, Flare, and Ghost image etc. Lenses for digital camera, crop factor. Aperture and its effects. Depth of field, depth of focus, hyper focal distance. Factors affecting the depth of field and the depth of focus. Circle of confusion and its effect on sharpness. | 12 |
| II | A) Exposure: Methods of estimation. Rule of Thumb. Law of reciprocity, Reciprocity failure. Incident light and reflected light, Exposure meter- types and comparison, differences between hand-held exposure meter and TTL exposure meter, metering modes, flash meter. Reading exposure levels, interpreting the meter reading. Brightness range and exposure value. B) Lighting: Types of light Sources, natural and artificial light. Spectral distribution of light sources, Hard & soft light. Basic lighting set up for a portrait. Key, Fill, Back & Top light. Brightness ratio and lighting ratio. Types of portrait lighting, Lighting for different subjects / situations. Flash light, Flash curves, Guide number. Electronic flash. Flash synchronization for different shutter speeds. Studio flash lights. | 12 |
| III | Filters used in Photography: Need of filters, types of filters, their uses, law of transmission and absorption, filter factor, factors governing filter factors. Filters for digital photography. Optical limitations of filters, Filter mount. Classification of filters, Optical materials. | 12 |

References:

1. Basic Photography, M. J. Langford, Focal Press
2. Advanced Photography (Vol.-I & Vol.-II) - M.J. Langford, Focal Press
3. Applied Photographic Optics- Sidney F. Ray; Focal Press
4. The Practical Guide to Photographic Lighting, John Tarrant, Focal Press
5. Light Science and Magic, An Introduction to Photographic Lighting, Fill Hunter, Steven Biver, Paul Fuqua, Focal Press

| Title of the Course and Course Code | Acoustics and Sound for Media (VPH2302) | Number of Credits : 02 |
|---|--|------------------------|
| Course Outcomes (COs) | | |
| On completion of the course, the students will be able to: | | |
| CO1 | Describe the basic characteristics of sound. | |
| CO2 | Explain various terms used in sound and acoustics, the basic principles of Acoustics and their applications. | |
| CO3 | Carry out the arrangement of microphones and loudspeakers as per the requirement of auditorium / classroom. | |
| CO4 | Analyze the acoustic quality of an auditorium. | |
| CO5 | Compare different types of loudspeakers, microphones. | |
| CO6 | Specify the requirements of the acoustics of auditoria studios / classrooms. | |

| Unit. No. | Title of Unit and Contents | No. of Lectures |
|-----------|---|-----------------|
| I | <p>A) Characteristics of Sound: Introduction, Generation of sound, Sound wave and its characteristics (Peak, compressions rarefactions, nodes / antinodes, Peak to peak amplitude, period and frequency of wave, pitch), Harmonics and overtones. Human ear as a transducer: External, middle and inner ear, IID and ITD. Intensity & Intensity level, Bel and Decibel, Decibel theory: Acoustic and electrical measurements, Sound Level Meter. Analogy between electrical, mechanical and acoustical quantities.</p> <p>Acoustic envelop: Attack, decay, sustain, release (ADSR) curve.</p> <p>B) Basics of Architectural Acoustics: Reverberation time, Sabine equation and Eyring Formula (Without derivation), Active enclosures with sound reinforcement systems. Synthetic reverberation, Audio delays, Anechoic chambers. Requirement of an auditorium, acoustic insulation. Acoustic characteristics of film, radio & T.V. Studios</p> | 12 |
| II | <p>A) Loudspeakers: Characteristics of Loud Speakers, Direct radiator dynamic loudspeaker, Horn and electrodynamic type loudspeaker, loudspeaker system for halls, theaters. Directional characteristics of loud speakers, three-way speaker mechanism system including woofer, midrange and tweeter, Cross-over networks, measurement of frequency response characteristics of a loudspeaker.</p> <p>B) Microphones: Characteristics and requirements of a microphone, Different types of microphones -Directional response and polar diagrams of different types of microphones: moving coil (dynamic), ribbon, condenser, carbon, electret and crystal. Factors governing the selection of microphones. Special types: lapel, wireless, shotgun.</p> | 12 |

| | | |
|-----|---|----|
| III | <p>Sound recording and reproducing Systems: Monophonic, Stereophonic, Surround System. Hi-Fi system, Principles of Sound recording: Magnetic Recording / Reproduction.</p> <p>Optical Recording / Reproduction - Types and methods of optical recording of sound on film, reproduction of sound on film, compact disc and playback process.</p> <p>P. A. System - block diagram, Home Theatre Systems - block diagram and use</p> | 12 |
|-----|---|----|

References:

1. Fundamental of Acoustics: Kinsler & Frey
2. Elements of Acoustical Engineering: Olson.
3. Acoustic Measurements: Berenek.
4. Audio and video system: R. G. Gupta

| Title of the Course and Course Code | Practical Course - III (VPH2303) | Number of Credits : 02 |
|---|--|------------------------|
| Course Outcomes (COs) | | |
| On completion of the course, the students will be able to: | | |
| CO1 | Identify the difference between basic and advance photo editing. | |
| CO2 | Differentiate between various studio accessories. | |
| CO3 | Apply appropriate image processing tools to modify the given image. | |
| CO4 | Arrange the lighting setup to reveal attributes of the given subject. | |
| CO5 | Assess a photographic image for its technical and aesthetic qualities. | |
| CO6 | Design a magazine cover / brochure. | |

| Sr. No. | Title of Experiment |
|-------------------------------------|-----------------------------------|
| Studio assignments | |
| 1. | Earthenware |
| 2. | Metal ware |
| 3. | Food |
| 4. | Flower |
| 5. | Glassware |
| Image processing assignments | |
| 6. | Changing background of portraits |
| 7. | Merging two different photographs |
| 8. | Skin retouching |
| 9. | Magazine cover designing |
| 10. | Page designing |

S.Y. B.Sc. Semester IV

| | | |
|--|--|-------------------------------|
| Title of the Course and Course Code | Colour Theory and Digital Photography (VPH2401) | Number of Credits : 02 |
|--|--|-------------------------------|

Course Outcomes (COs)

On completion of the course, the students will be able to:

| | |
|------------|--|
| CO1 | State the various colour theories. |
| CO2 | Explain the science and technology of digital photography. |
| CO3 | Apply the colour theory to generate aesthetically sound photographic images. |
| CO4 | Analyze a photographic image technically and aesthetically. |
| CO5 | Assess the impact and significance of colours in visual communication. |
| CO6 | Design a colour scheme for product promotion. |

| Unit. No. | Title of Unit and Contents | No. of Lectures |
|------------------|---|------------------------|
| I | A) Colour Theory: Human vision, Science of colour, Black body radiation and colour temperature, Kelvin and Mired scales, Primary, secondary and tertiary colours, Additive and subtractive colours, Colour attributes (Hue, Saturation & Brightness), Colour description (Tint, Tone, Shade & value), Colour schemes (Achromatic, Monochromatic, Complementary, Split complementary, Analogous, Diad, Triad, Tetrad), Colour Models (Adobe models). B) Impact of colours: Colours for communication, Colour symbolism, Sociology of colours, Psychology of colours, Cultural relevance of colours. Colours in art, Colours as design element | 12 |
| II | Colours in digital photography: Meaning of digital colours, Digital primary and secondary colours, Additive and subtractive colours, Colour spaces and colour gamut, Colour attributes, Munsell system and CIE system, Colours printing (monitor calibration, resolution for printing), Bit depth and colours. Colour calibration, Colours in various display screens. | 12 |
| III | Digital photography: Digital photography terminology, Prosumer digicams, Digital SLRs, Choosing a Digital SLR System, Check list of essential equipment, Digital camera sensors and their types (CCD & CMOS), Spectral response of a sensor, Anatomy of a sensor, Sensor characteristics, Sensor sizes (Cropped & full frame), Crop factor, Lenses for digital camera, Histogram, Dynamic range. Analog to Digital Conversion in a digital camera. Concept of white balance and its relation to colour temperature. | 12 |

References:

1. The Book of Colour: The beginner's Guide to Colour Theory, Polina Traore
2. Design Elements: Colour Fundamentals, Aris Sherin
3. Contemporary Colour: Theory and Use, Steven Bleicher
4. Theory of Colours, J. W. Goethe
5. Digital Photography Book, Scott Kelby
6. A large number of photography related sites are available on the internet.

| Title of the Course and Course Code | Principles & Applications of Digital and Analogue Communication (VPH2402) | Number of Credits : 02 |
|---|--|-------------------------------|
| Course Outcomes (COs) | | |
| On completion of the course, the students will be able to: | | |
| CO1 | Identify and describe various elements involved in a communication system. | |
| CO2 | Explain the functions of frequently used communication system and devices used in media. | |
| CO3 | Classify communication systems and devices frequently used in media. | |
| CO4 | Differentiate amongst various modulation techniques. | |
| CO5 | Compare various sampling techniques. | |
| CO6 | Develop an understanding of digital pulse modulation and source coding techniques. | |

| Unit. No. | Title of Unit and Contents | No. of Lectures |
|------------------|---|------------------------|
| I | A) Basics of communication systems: Introduction, Basic Communication System, Need of modulation, Data communication, Representation of data (ASCII, Baudot Code), Data transmission i.e. Parallel, Serial, Modes of Data transmission (Asynchronous, Synchronous), Simplex, Duplex, Transmission channels & it's characteristics, Transmission medium. B) Analog Modulation: Principles of AM, FM, Power relations of AM wave, SSB, DSB, DSBFC, DSBC, VSB, Characteristics of receiver i.e. Sensitivity, Selectivity, Fidelity etc. Demodulator, Automatic gain controller(AGC) | 12 |
| II | Digital modulation techniques for MODEM: Role, types and comparison of MODEM, Data multiplexers, FSK, PSK, QPSK, Digital continuous wave modulation techniques for modem. Sampling & Pulse Modulation: Analog and discrete time signals and systems, Sampling process, Sampling theorem, Nyquist rate, reconstruction of original signal, aliasing, Effect of non ideal filter, Sampling techniques, Pulse modulations (PAM, PWM, PPM) generation & detection. | 12 |
| III | Digital Pulse Modulation & Source Coding techniques: Introduction to digital communication, Pulse code modulation, PCM encoder/decoder, CODECS, Types of quantization, Signal to quantization ratio, Compandings, Multiplexing & Multiplexing hierarchy, Linear delta modulation, Transmitter & Receiver, Adaptive delta modulation (ADM), Present communication methods: Digital multiplexing, Classification of digital multiplexing, OFDM spread spectrum, DSL, Sonnet, ISDN, PSTN, Cell-phone fundamental and working. | 12 |

References:

1. Principles of electronic communication systems, Louis E Frenzel, 3rd Edition.
2. Electronic communications: Roody-Coolan
3. Electronic-communication: J. S. Chitode
4. Principles of communication engineering: Anok Sinha
5. Modern electronic communication: Miller Beasley (PHI)

| Title of the Course and Course Code | Practical Course - IV (VPH2403) | Number of Credits : 02 |
|---|--|-------------------------------|
| Course Outcomes (COs) | | |
| On completion of the course, the students will be able to: | | |
| CO1 | Identify the difference between basic and advance photo editing. | |
| CO2 | Differentiate between various studio accessories. | |
| CO3 | Apply appropriate image processing tools to modify the given image. | |
| CO4 | Arrange the lighting setup for a fashion shoot. | |
| CO5 | Assess a photographic image for its technical and aesthetic qualities. | |
| CO6 | Design an album / catalogue. | |

| Sr. No. | Title of Experiment |
|-------------------------------------|---|
| Studio assignments | |
| 1. | Fashion photography |
| 2. | Portfolio shooting |
| 3. | Layout shooting |
| 4. | High Key lighting |
| 5. | Low Key lighting |
| Image processing assignments | |
| 6. | Creating desktop/mobile device wallpapers |
| 7. | Creating own brushes/brush presets |
| 8. | Creating custom shapes in Photoshop |
| 9. | Album designing |
| 10. | Catalogue designing |