



Guidelines for developing Online Courses for SWAYAM

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**Government of India
Ministry of Human Resource Development
Department of Higher Education**

Revised Guidelines for developing online courses for SWAYAM



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BACKGROUND AND PERSPECTIVE

Whereas, with a view to providing access to the best quality learning resources across the country, the project 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) has been started.

Whereas, SWAYAM provides an integrated platform and portal for online courses, using information and communication technology (ICT) covering High School till all higher education subjects and skill sector courses to ensure that every student benefits from learning material through ICT;

Whereas, SWAYAM is a:

1. One-stop web and mobile based interactive e-content for all courses from High School to University level.
2. High quality learning experience using multimedia on anytime, anywhere basis.
3. State of the art system that allows easy access, monitoring and certification.
4. Peer group interaction and discussion forum to clarify doubts
5. Hybrid model of delivery that adds to the quality of classroom teaching.

Whereas, SWAYAM involves development of Massive Open Online Courses (MOOCs) compliant e-content (video and text) and building a robust IT platform;

Whereas, in order to disseminate educational content to masses, the MHRD has launched 32 Direct-To-Home (DTH) educational TV channels called "SWAYAM Prabha" broadcasting education content 24x7 basis, and the content developed under SWAYAM would be used for transmission in SWAYAM Prabha (SP) DTH channels.

Whereas, there is a need for synergizing the quality of contents on these platform, and for standardizing the content delivery;

Now, with a view for systematic development of the online courses for the SWAYAM, the following guidelines which propose to lay down technical and production standards for the e-content have been issued:

1. DEFINITIONS:

1.1. In these guidelines, unless the context otherwise requires, the following words shall have the following definitions:

- a) '**Academic Advisory Council (AAC)**', shall mean a group of academicians of repute identified and appointed by the National Coordinator with the mandate of identifying the CCs, examining the course proposals and approving them.
- b) '**Course Coordinator (CC)**': The CC shall be a Subject Matter Expert (SME) belonging to a reputed educational institution/Industry or a specialist in the field identified and entrusted with the task of developing online course in a



- given area by the NC.
- c) '**Course**' shall be of two types: credit courses and non-credit courses.
- Credit Course* shall mean a course which is taught for at least one semester as a part of a subject/programme.
 - Non-Credit Course* shall include courses like awareness programme, continuing education programme or training of specific skill set as independent course, which are not part of any set curriculum. It can be of shorter duration.
- d) '**Four quadrant approach**': The four Quadrant approach means e-learning system that has the following components:
- Quadrant-I is e-Tutorial; which shall contain: Video and Audio Content in an organized form, Animation, Simulations, video demonstrations, Virtual Labs, etc, along with the transcription of the video.
 - Quadrant-II is e-Content; which shall contain; self instructional material, e-Books, illustrations, case studies, presentations etc, and also contain Web Resources such as further references, Related Links, Open source Content on Internet, Video, Case Studies, books including e-books, research papers & journals, Anecdotal information, Historical development of the subject, Articles, etc.
 - Quadrant-III is the Discussion forum for raising of doubts and clarifying them on a near real time basis by the Course Coordinator or his team.
 - Quadrant-IV is Assessment, which shall contain; Problems and Solutions, which could be in the form of Multiple Choice Questions, Fill in the blanks, Matching Questions, Short Answer Questions, Long Answer Questions, Quizzes, Assignments and solutions, Discussion forum topics and setting up the FAQs, Clarifications on general misconceptions.
- e) '**Host Institute**', Educational Institute offering the MOOC and conducting end examination, awarding credits and certification.
- f) '**MOOCs**': Massive Open Online Courses (MOOCs) are such online courses which are developed as per the pedagogy stated herein and following the four quadrant approach.
- g) '**National Coordinators (NCs)**': National Coordinators are the Institutions that have been so designated by the Ministry and assigned a specific sector for preparation of online courses for SWAYAM.
- h) '**Parent Institute**', Institute to which student registered for MOOC is enrolled.
- i) '**Sector**' shall mean a particular level or discipline of learning allotted to a NC by the MHRD.
- j) '**Subject Matter Expert Groups (SMEGs)**' shall mean a group of reputed academicians in a particular subject identified by the National Coordinator in each subject.
- k) '**Subject**' shall mean a specific area under a discipline (Example: Physics) taught in an educational institution consisting of specific programme/ courses, resulting in the award of a certificate/ diploma/ degree.
- l) '**SWAYAM Academic Board**' shall be a apex academic body that would lay down standards of quality for the courses to be offered through SWAYAM.
- m) '**SWAYAM Board**' shall be the Authority that would be overall in-charge of the formulation of the Platform, prescribe quality of content and facilitate conduct of examinations.



2. SWAYAM Board

SWAYAM Board (SB) shall be the Body for managing the SWAYAM and SWAYAM Prabha by coordinating the work of technical and academic bodies so as to deliver high quality online education.

- a) Composition: The Board shall have the following membership:
- Secretary (Higher Education) – Chairperson
 - Chairperson UGC
 - Chairperson AICTE
 - (5) Bureau heads from the Ministry of HRD (ex-officio) looking after: Technical Education, Management Education, Higher Education, School Education, Open/Distance Education
 - All National Coordinators of SWAYAM and SWAYAM PRABHA
 - JS&FA of MHRD
 - Mission Director NMEICT (Member Secretary)
- b) Functions: The SB shall discharge the following functions:
- Take decisions for smooth running of SWAYAM and SWAYAM PRABHA platforms.
 - Lay down Policy regarding implementation issues including: cost payable for development and delivery of the courses, examination fees, accepting the content from foreign/private institutions/universities, within parameters laid down by the competent authority.
 - Review the progress of each NC pertaining to sanction, progress, development and delivery of various online courses.
 - Any other matter that has arisen during the operation and delivery of SWAYAM and SWAYAM Prabha.
- c) Secretariat: The SB shall have a secretariat located in AICTE/ MHRD for servicing the Board, composition of which would be decided by the Board.

3. SWAYAM Academic Board (SAB):

- (1) There shall be a SWAYAM Academic Board responsible for guiding the National Coordinators and for laying down quality standards. The SAB shall be constituted as follows:
- Chairman UGC – Co Chairperson
 - Chairman AICTE – Co Chairperson
 - Two technical experts nominated by the Ministry
 - Two reputed academicians nominated by the Ministry
 - Two representatives from the Industry, one each nominated by MSME and Ministry of Skill Development
 - Director AICTE – Member Secretary
- (2) The SAB shall discharge the following functions:
- Monitor the quality of the courses on the SWAYAM and lay down quality standards.
 - Offering of courses on SWAYAM
 - Integration of SWAYAM and SWAYAM Prabha
 - Monitor the progress of conduct of the end-term examinations



- for the SWAYAM courses and resolve issues if any.
- v. Monitor the progress of transfer of credits and resolve issues if any.

4. NATIONAL COORDINATORS

4.1. The following shall be National Coordinators for each of the Sectors for the purpose of development of the e-content, delivery of online courses and overseeing the assessment procedures of courses offered on SWAYAM. However, the Ministry can add National Coordinators from time to time depending on the need for expanding the Courses to be offered:

S. No.	National MOOCs Co-ordinator	Sectors
1	University Grants Commission(UGC)	Non-Technology Post Graduate Degree Programmes.
2	NPTEL	Technical / Engineering UG & PG degree programmes.
3	Consortium for Educational Communication	Non Technology Under Graduate Degree programmes.
4	IGNOU	Diplomas and Certificates programmes
5	NCERT	School Educational Programmes from Class 9 th to 12 th .
6	NIOS	Out of school children Educational Programmes from Class 9 th to 12 th .
7	IIM Bangalore	Management programmes.
8	NITTR, Chennai	Teacher Training programme.

5. SCOPE OF SWAYAM

5.1. The SWAYAM shall cover the following:

- Curriculum based course contents covering diverse disciplines such as arts, science, commerce, performing arts, social sciences and humanities, engineering, technology, law, medicine, agriculture etc. in higher education domain (all courses to be certification-ready).
- School education (9-12 levels) modules; for teacher training as well as teaching and learning aids to learners to help them understand the subjects better and also to help them in better preparedness for competitive examinations for admissions to professional degree programmes.
- Skill based courses, which cover both post-higher secondary school skills that are presently the domain of polytechnics as well as industrial skills certified by the sector skill councils of various Ministries.
- Advanced curriculum and professional certification under a unified scheme in higher education domain that can be tailored to meet the demands of Choice Based Credit System (CBCS) currently being implemented in India at under graduate level.
- Curricula and courses that can meet the needs of life-long learners.



- f) Independent courses which may not be part of any set curriculum and may be taught as awareness courses, continuing education programme and for training of specific skill sets.

6. Creation of online courses for SWAYAM:

6.1. Identification:

The National Coordinators (NC) shall ensure that work of converting a course into a MOOC shall be done in a comprehensive manner, such that there is complete coverage of all the courses in a subject/programme.

- a) The NC shall identify courses where online education is possible and preferred. The identified courses shall be advertised in newspaper and other media calling for Expression of Interest (EoI).
- b) In all identified courses, **Expression of Interest** (EoI) can be invited for credit courses from CC through recognised Universities/ Institute of National Importance and other educational Institutions authorized to award degrees/credits and from subject specialists both in Public and Private Sectors for non-credit courses.
- c) The CC while submitting the expression of interest (EoI) shall also submit an undertaking from a Host University/Institution conveying its willingness to offer the course for credit, conduct examination, assessment, evaluation, issue certificates and transfer the credits to the students of the Parent University/Institution as per the UGC/ AICTE/any other regulatory body Regulations issued for the purpose.
- d) After evaluating the EoI received, the NC shall identify a Course Coordinator (CC) for each Course, based on (i) the quality of the sample content, (ii) reputation of the expert/ institute and (iii) teaching-learning methods proposed, and invite him/her to prepare the MOOC within 6 months from that date.
- e) The NC shall ensure that no further courses are allotted to a CC unless he/she has successfully completed a course allotted earlier.
- f) In case two or more CC from the same Institution drop / discontinue courses at a given time, the host Institute shall be denied further participation for a stipulated time.
- g) In case, the selected CC is a private person or a private institution, not entitled to award credits/ certificate, it shall identify a public Institution authorized to offer credits/ certificate for the course and issue certificate, as Co-applicant. An MoU between the two defining their roles will be formulated and later approved by the NC / SB.
- h) The NC shall constitute the following Committees immediately:
 - i. **Academic Advisory Council** (AAC) consisting of academicians for assisting the NC to consider and take decisions on every MOOC proposal.
 - ii. **Subject Matter Expert Groups** (SMEGs) for each subject consisting of academicians for evaluating the Proposals for Online Courses and make recommendations for its acceptance, improvement or rejection.
- i) The courses, which carry credits/ certification, shall be cleared by the 'host' University/Institute, who shall also agree to conduct End Examination, assessment and grant credits/ certification.



6.2. Pre-production activities (12 weeks/Online Course)

- a) Each CC shall constitute an academic team of educationists with proven abilities for preparation of the Teaching Learning Material (along with the pedagogy and the activity-based interventions for improving the delivery of the content).
- b) The CC shall, within 2 weeks from the date of appointment, prepare a
- c) **Proposal for MOOC** consisting of the following and submit the same to the NC for approval:
 - i. Introductory module: Defining the Course design, qualifications for taking the course, introductory video, assessment system, credits to be awarded, starting date/ending date, and expected outcomes.
 - ii. Scheduling of course: lectures / reading material / assignments / quizzes/ test into weeks and short modules.
 - iii. Instructional videos to be prepared – along with the transcript, multi-media techniques to be used, and the name of the teacher-on-the-camera.
 - iv. Details of reading material such as lecture notes / additional readings to be provided.
 - v. Self-assessment modules: The total number of quizzes and assignments to be provided for the course.
 - vi. Assessment system: Weekly /biweekly assessments and assignments that would be required to be taken by the students.
 - vii. Reading material: Notes/extra readings.
 - viii. Self-assessment modules: Quizzes and tests.
 - ix. Assessment system: Weekly assessments and assignments.
 - x. Discussion forum: List of Teaching Assistants for handling the discussion forum and answering queries raised by registered Students.
 - xi. The CC shall ensure that the Online Course, (where **Credits/Certificate** on the Course are to be offered) under SWAYAM, (i) is Cleared by a University/ Institute and (ii) the University/ Institute agrees to issue certificate(s) and **'Transfer the Credits'** to Registered Students under SWAYAM that are existing as regular & enrolled students from a recognized University/Institute across the country and shall follow, the UGC & AICTE (Credit Framework for Online Learning Courses through SWAYAM) Regulation, 2016, a 'Gazette Notification' issued on 19th July 2016 & 17th August 2016, respectively.

Non-submission of the proposal in the above manner within the given period shall automatically result in cancellation of the order entrusting the work.
- d) On receipt of the Proposal for MOOC, the NC shall place the same before the **Subject Matter Expert Groups (SMEGs)** for its consideration. The SMEGs shall convey its approval, amendment or rejection within Three weeks. In case the Subject Matter Expert Groups (SMEGs) makes suggestions for improvement/changes, the CC shall make the changes and present the same within 2 weeks further. The Subject Matter Expert Groups (SMEGs), may thereupon, make the final recommendation to the Academic Advisory Council (AAB).
- e) Based on the feedback given by the Subject Matter Expert Groups (SMEGs), the Academic Advisory Council (AAB) shall examine each



proposal and either approve, suggest changes or reject same within a further period of 2 weeks from the date of receipt of Subject Matter Expert Groups (SMEGs) report. The AAB shall also recommend to the NC the required budget for preparing the MOOC.

- f) The NC shall thereupon, and without any further delay, communicate the decision to the CC and also release the funds required for starting the production.

6.3. Production activities (8 weeks/ Online Course)

On receipt of the approval from the NC, the CC shall proceed for production of the videos in the following manner:

- a) **Identification of the studio:** In order to have uniformity in Technical quality of contents developed under SWAYAM & have compatibility between contents developed by NMCs, it is recommended to have uniform set of equipment being used by CCs. The studio hired by CC shall have all equipment as listed in **Annexure-I**. In case a studio of these specifications is available in the institution, the same shall be used. Otherwise, a studio with these facilities can be hired for the purpose of making these Programmes as per the rates given in **Para 9 A**).
- b) **Production team:** There shall be a Production team experienced in preparing Programmes for educational purposes, consisting of a Director/Producer, Instructional Designer, Production Assistant, Camera persons, multi-media technicians and Editors, who can be paid by the Course Coordinator as per the rates given in **Para 9 A**).
- c) **Duration of content:** A four-credit course may have overall duration of about 20 hours of video lectures and reading Module (a course may have upto 40 Modules). Content is required to be submitted in a hard disk, the (i) 'Video Edit files' @ 10 Mbps for transmission on SWAYAM PRABHA and (ii) further compressed files @ 2.5 Mbps along with other TLM (in SWAYAM Template) for delivery through SWAYAM.
- d) **Presentation techniques:**
- The production of programme may be done in a manner that a substantial part that at least 75% of the total duration of each production should use innovative learning techniques viz. case-studies, scenarios, animation, analogies, individual or group activities, concept-mapping, in-text learning quizzes, interactive exercises within learning modules, discussion forum, multi-media techniques, innovative graphics, live experiments, demonstrations, role-plays, field documentaries etc.
 - It shall be the responsibility of the CC to ensure that none of the graphics, animations, images, sound clips, video clips used are plagiarized or cited without formal permissions from owners who must be informed of the distribution policies of SWAYAM.
 - It shall be the responsibility of the CC to ensure that none of the graphics, animations, images, sound clips, video clips used are plagiarized.
 - Whereas direct lecture focused on the teacher can be used, it may be kept for less than 15% of the total duration of video. Even in this case, the teacher should speak extempore and should not read from written material or even a Teleprompter. It should be ensured that the teacher before the camera is presentable as per television practices.



- e) **Transcription of Video** shall be prepared along with the programme, which may be needed for translation of the transcript and for sub-titling in other languages.

6.4. Post production activities (4 weeks/Online Course)

There shall be a post-production team consisting of the Video Editor, Sound Editor and Music team, equipped with video editing software working in Non-Linear Editing System (NLE) along with suitable equipment listed in **Annexure-I**. They shall be responsible for:

- Video editing the programme using HD parameters.
- Writing, (re)recording, and editing the soundtrack if needed.
- Adding visual special effects, multimedia effects and computer-generated imagery (CGI)
- Sound re-recording or mixing with professional audio equipment.

6.5. Review of the Course content and approvals (4 weeks/Online Course)

- a) On completion of the programmes, the CC shall intimate the NC about the readiness for review of the Course.
- b) Immediately thereupon, the NC shall get the course Previewed/reviewed from academic and technical experts and thereafter convene the SMEGs meeting for viewing the course in detail along with the video and reading resources.
- c) The SMEGs, after viewing the course shall verify the following and based on these recommendations, the NC will place the course before the AAB, which will approve the Course for uploading on the SWAYAM portal:
 - Final typos and grammar checks.
 - Brand language/message (i.e. in keeping with Online Course guidelines)
 - Pedagogy and learning experience.
 - Formatting of text and images.
 - Ensuring the presence of basic Online Course elements like video/e-Content, discussion forums, Interactive elements, assignments, assessment methodology etc.
 - Video quality checks.
- d) The NC in consultation with the CC, will also recommend the 'Start date' and the 'End date' for the course.
- e) Based on these recommendations, the NC will place the course before the AAB, which will approve the Course for uploading on the SWAYAM portal.

7. Notification of Course to all Universities

As soon as AAB approves a course, the same will be reported to the SWAYAM Board by the NC. The SWAYAM Secretariat shall request the concerned regulator to communicate to all Universities/Institutes under their jurisdiction to notify the courses to their departments and affiliating institutions for availing and transfer of credits by students enrolled with them.

8. ASSESSMENT AND CERTIFICATION

- a) The CC shall decide the suitable assessment system for the course based on the stated learning outcomes, in consultation with the host University/



institution offering the course.

- b) Normally, the assessment shall have both formative assessment to promote deeper learning, critical thinking and reflection, in combination with summative assessments designed to gauge student achievement and/or performance. Summative assessments may include graded quizzes, reports or projects, peer assessments or proctored examination. Whereas an online examination would be the preferred mode, the CC may decide on the mode of conducting the final examination. Efforts must be made to include industry or industry bodies as partners in the certification process for further value addition to the students. Wherever possible, education and R & D team members from the industry need to be included in the design of course contents and problem sets. However, problems may be of a generic nature and specific practices of participating industries should not be used as contents.
- c) In case, a pen and paper final examination is to be conducted, the same shall be offered through any college/school volunteering to conduct the same. The decision in this respect will be taken by the host institution.
- d) After conduct of the examination and completion of the evaluation, the host institution shall award marks/grade as per the evaluation scheme announced, within 4 weeks from the date of completion of the final examination.
- e) On successful completion of each course, the host institution offering the Online Course would issue the certificate, along with the number of credits and grades, through which the student can get credits transferred into his/her marks certificate issued by his/ her parent institution.

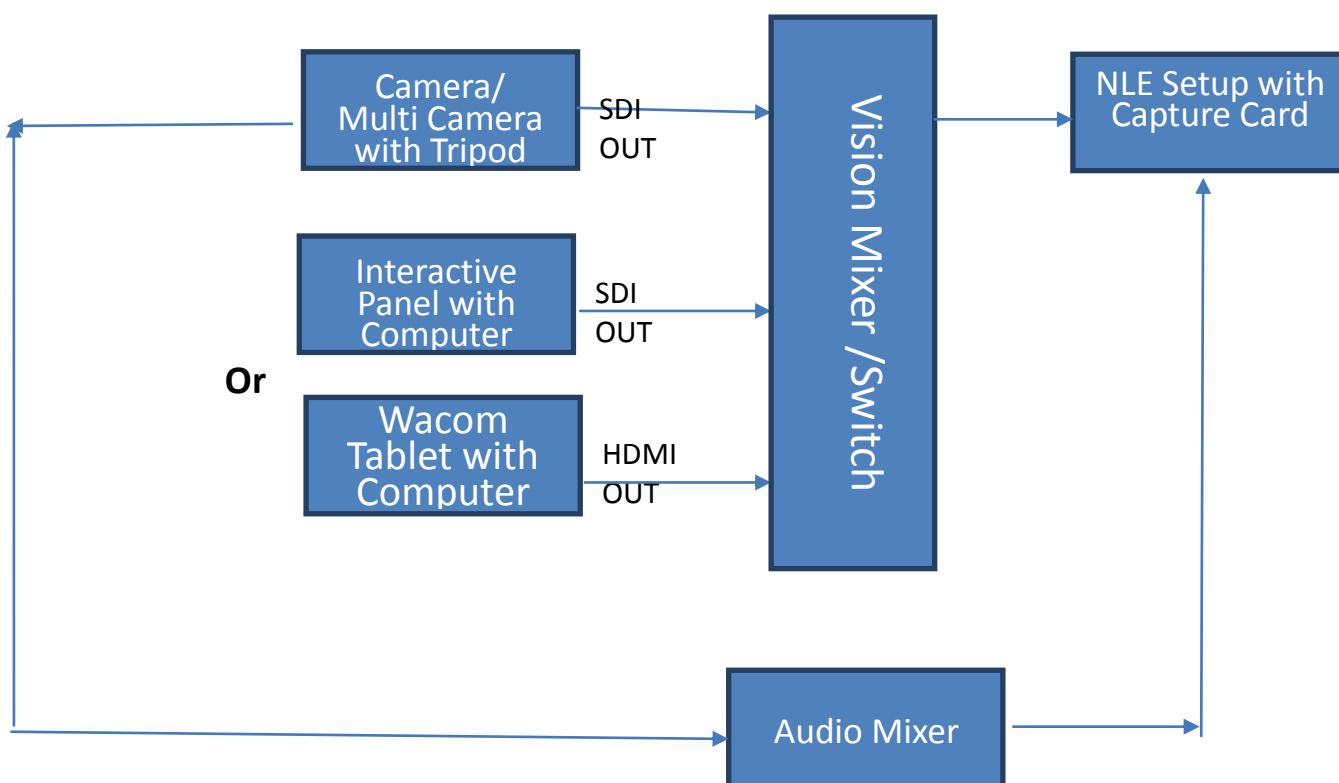
9. INTELLECTUAL PROPERTY RIGHTS /COPYRIGHTHANDLING

- a) The CC shall follow copyright laws for any readings, images, and video clips used as core and supplementary reading in case of licensed material if used and submit an undertaking to that effect to the NC.
- b) All contents (text, audio, video, animation, quiz etc.) developed with the funding of NMEICT will be the property of SWAYAM.
- c) All courses and contents posted in SWAYAM will be copyrighted to SWAYAM. Ministry will, from time-to-time, announce policies for access and charges, if any (for certification) and will also publish appropriate Open Educational Resources policy in consultation with other national and international bodies.
- d) The CC shall be given explicit permission for creating books and other distribution materials ever for commercial purposes with the explicit undertaking that contents published in SWAYAM shall remain there.
- e) The terms of service should be clearly laid out so as to address the following key points by the CC:
- Any disclaimers should be clearly spelt out.
 - User /student/ institutions should be informed about the usage rights of the course content available on SWAYAM.

Equipment Setup & Specifications, for use in development of Online Course.

Note: Make/Models/trade names appearing in Annexure-I are indicative only, equipment with similar or better features & Specification are acceptable.

Block Diagram



1. Camera(s):

Three 1/3" type; Full HD CMOS sensors; PAL color; 1920x1080/50i; Gross Pixels \geq 2.2 Million; camera to have a resolution of \geq 850 TVL; Sensitivity: \geq F10; S/N 54 db; Motorized Zoom Lens > 20X (28 mm to 560mm) with optical image stabilization; Proxy Video; Aspect Ratio 16:9; Audio: AAC 2ch, 16bit, 48kHz; Multi-Camera Synchronizing with Genlock IN and TC IN/OUT; HD Recording \geq 50 Mbps, should also support Intra / LONG GOP recording. Two or more Memory Card/Media Slots, Hot Swap for Continuous Recoding, with content security features. To support AVC H.264/MPEG4, MOV Files / Quick Time; Video out: SDI & HDMI.

Camera to have a suitable **Tripod**, with minimum payload (> the weight of Camera setup). Tripod should have floor spreader.



2. Non-linear editing:

Specifications: Non-Linear Editing Unit.

a). Editing Software: Adobe Creative Cloud for Teams

c). Hardware:

- Windows 10 Professional 64bit OS
- 1TB 7200 RPM SATA 1st Hard Drive
- 500GB 7200 RPM SATA 2nd Hard Drive
- USB Keyboard
- USB Optical Mouse
- SuperMulti DVDRW SATA 1st
- NVIDIA Quadro GPU (K4000 or better)
- Dual Xenon Processor Air Cooling Kit (E5-2620 v2 2.10Ghz 15MB 1600 6C 1st CPU)
- 32GB DDR3-1866 (8x4GB) 2CPU Unbuffered RAM
- 21" Monitor (1920 X 1080).

d). Video Capture Card compatible to the NLE software similar to Black Magic Design/ HD Extreme / AJA / MATROX / DVS.

Native editing for DV, DVCAM, DVCPRO, DVCPRO 50, DVCPRO HD, AVC-INTRA, Long GOP, XAVC, FireWire device control, Still images: PSD, BMP, JPEG, PICT, PNG, SGI, TARGA, TIFF. Support for AIFF, WAV, MP3, CAF, BWF, SDII, NeXT, QuickTime.

e). Effects: FxPlug support, Real-time software-based audio normalization, RT Extreme for scalable software-based, multi stream real-time effects in DV, SD, and HD formats, Real-time effects playback on main display and on NTSC/PAL or HD monitora with perfect synchronization, Dynamic RT for automatically adjusting playback quality and/or frame rate based on hardware capabilities Key frame graphs and editing in Viewer or Timeline, More than 200 transitions, effects, and filters, Import multilayered Photoshop files with layers and alpha support

f). Character Generator Software with latest Patches to support English/ Hindi –Devnagri, technical & scientific fonts, symbols etc.

3. **Card Reader:** compatible to the Memory Card of Camera's:

4. **(a) Interactive 27" Multi Touch Display & Pen:**

Resolution >5000 lpi; Having >2000 pressure levels, widescreen 16:9 display; resolution of 2560 x 1440; Using Adobe RGB; 1.07 billion colors; Works with Photoshop® and Adobe® Illustrator CC; USB-3 & HDMI connectivity to PC & Mac; with features to Brush, Draw, Paint, Image editing, 3D Animation, scroll, zoom and rotate.

OR

4. (b) Interactive touch screen panel with required computer, pen and software.

Interactive touch screen panel with required computer, pen and software & appropriate adjustable Mount with total upto 6' Height.

LCD Panel:

≥ 50 inch widescreen.



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Max resolution:	1920 x 1080
Brightness:	300 cd/m ² or more
Contrast ratio:	3,000:1 or better
Response time:	6 ms or better
Driver:	OS: Windows / Linux/ MAC
Touch pen or Finger Interactivity:	Yes
Video input:	Compatible with the computer
Video outputs:	Compatible with the computer & Vision Switcher

Note:

- a. The interactive panel system should be provided with: a computer having at least one HDMI output port, two USB ports and a trolley stand.
- b. PC should have a single processor Intel Core i7 4930K 3.4 GHz or higher and the VGA card should be GTX 780 or higher. Equivalent AMD VGA card may also be provided with MS Office suite latest version installed.
- c. Any digital peripheral / glues / distribution amplifier required with the system should be quoted as per the offered workflow design.

5. Laptop Touch Screen ≥15"

- Processor: Intel® Core™ i5 processor or better, 2.40 GHz or more.
- Operating system: Windows 10, 64bit.
- Display: 14.0" or 15.0"
- Memory: 8GB (4GB x2) DDR3 1600Mhz or more.
- Hard drive: 500GB 5400RPM for laptop, SATA hard drive.
- Open Office suite latest version.
- Optical drive.
- Wi-Fi, LAN, Bluetooth.
- HDMI true HD support Out Put.
- Built-in speakers for laptop.
- Ports: network connector RJ45, HDMI, USB 3.0, headphone jack, microphone jack, SD card reader.
- Battery capacity 4 hours or more continuous use.
- Ampli-speakers for the PCs.

6. Vision Mixer/Switcher

For connecting Cameras, Interactive Panel and Tablet: 4-CH HD Video Switcher with Inbuilt Frame Synchronizer on all inputs, Frame Storage capabilities, supporting 2-CH HD-SDI, 2-CH HDMI inputs, 2-CH HD-SDI & 1-CH HDMI outputs, 1 x Chroma-Keyer, 1x DSK.

7. Audio mixer:

Input channels: 8 Channels with minimum 6 Mic/Line selectable inputs.
 I/O interface: XLR / Phono, (balanced/un-balanced).



Input sensitivity: Mic -60 db or better, Line 0 db
Audio frequency response: ≤ 20 Hz - ≥ 20 KHz ± 0.5 db
Total harmonic distortion & noise: ≤ 0.01 % -30dbBu input routed to Mix, Mic gain 30dB
S/N ratio: Better than 100 dB
EQ bands: 2 (HF, MF & LF)
Variable send (aux) buses: Minimum 2
Returns: Minimum 2

Other features:

- True, professional +48V phantom power (min 2 I/P) for condenser microphones.
- Linear / Slider fader.
- RCA / Phono playback inputs and record outputs.
- Peak LEDs on all input channels.
- Mute and PFL on input channels. Output metering.

8. Microphones:

UHF wireless Lavalier / collar diversity microphone with Compatible Receiver having minimum of 6 selectable channels as per Indian region

THD: ≤ 1 %
Signal/Noise ratio: ≥ 100 dB
Rf output: ≥ 25 mW
Battery life (operating time): Min. 8 hours (2AA Batteries)
Polar pattern: Supercardioid / Hypercardioid / Cardioid
Mic type: Electret /Condenser / permanent Polarised
Frequency range: ≤ 40 Hz to ≥ 20 kHz ± 3 db,
Receiver Output: XLR (Balanced) Line output
Accessories: Wind shield, Mic Clip & other standard accessories

9. Active speaker (2 way)

Type: Active
Low/mid driver dimensions: 5" or more
Tweeter dimensions (mm): 20 mm to 40 mm
RMS: (Both LF + HF): ≥ 50 watts
Frequency response: ≤ 45 Hz - ≥ 20000 Hz
Max. SPL: ≥ 100 dB
Protection circuits: Overload
Controls: Treble, volume, mains switch (on/off)
Line inputs: Minimum 1
Line inputs connectors: XLR & 6.3 mm Jack
Input Sensitivity: Selectable -10 dB/+4 dB
Operating voltage: 230 V A C $\pm 10\%$, 50 Hz

10. Studio Cool Lights:

STUDIO LED Lights– for Day Lights:

- a) LED \geq 50 W with diffuser & Barn-doors.
 1. Colour temperature: about 5600K & 3200K
 2. Control: Manual.
 3. Ceiling Mount.
 4. On board system to control intensity from 0-100%
 6. 4 leaf barn door, diffusers, C clamp, safety bond
- b) LED Diffused Panel lights, \geq 50 W –
 1. Colour temperature: about 5600K
 2. Control: Manual
 3. Ceiling Mount.
 4. 4 leaf barn-door, diffusers, C clamp, safety bond.

11. UPS:

Approved Brands Company ISO 9001 with minimum 30 minutes backup. Sealed maintenance free VRLA Battery. If more wattage UPS is required, bidder should justify the same by submitting the Power Load requirement of the equipment. Some of the features required in UPS are:

- Single Phase IN and Single Phase OUT
- Wattage: \geq 10 KVA
- Type:(On-line) IGBT
- Input power factor: \geq 0.98
- Output power factor: 0.8 or better
- Input power supply: 160 V - 270 V 50HzAC.
- Output 230 V \pm 1%, 50 Hz AC.
- Isolated I/p o/p. Battery Bank with Frame/Rack

B) Post Production processes & Standards.

- Video recording format: Full HD 1920x1080 pixels.
- Videos aspect ratio: 16:9 (widescreen).
- Module Delivery: 1080i following MPEG-4 AVC Compression.
- Audio Channel 1 to have Mixed Audio Track.
- Font size: Heading: 24-30; Sub-heading: 22-26; Body: 20-24;
- Full screen Video Frame.
- All graphs and diagrams must have clear font.
- The expert/teacher should speak extempore as delivery made in case of classroom set-up and avoid reading from written material or a Teleprompter.
- Video frame to maintain 6-8% headroom;
- Video quality and Audio levels should be constantly monitored while recording.

Voice modulation be taken care of. Video clips or audio clips from eminent experts, outdoor shooting, lab based demo etc. can be used appropriately.
