PROGRAMME Guidance

for

NZC in Entertainment and Event Technology Level 4 with strands in Entertainment Rigging, Lighting, Audio, Vision, Stage Management, Stage Mechanics, and Scenic Construction (NZQA ref 5367)

Industry expects that programmes leading to the following qualification consider these programme specifications:

- **NZ Certificate in Entertainment and Event Technology (Level 4) with strands in Entertainment Rigging, Lighting, Audio, Vision, Stage Management, Stage Mechanics, and Scenic Construction (NZQA ref 5367)**

These specifications have been developed in collaboration with the Entertainment and Event Technology sector and reflect their expectations for quality graduates seeking employment, or already employed, and volunteers in the industry.

It is the expectation that providers consider this programme guidance when

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Version 1.1

TOI MAI Workforce Development Council

New Zealand in Entertainment and Event Technology Level 4

This qualification provides the entertainment and event technology industry with technicians who can operate safely, under supervision.

The qualification includes strands that recognise specialist knowledge and practical skills in various areas relating to entertainment and events technology.

Within this qualification, health and safety knowledge and skills are implicit in all activities and tasks completed by technicians in every discipline, including, self-management, following codes of conduct and guidelines, problem solving and troubleshooting. Interpersonal and customer service skills are required to identify and respond to the needs of other crew members and personnel involved in the event or performance.

General Conditions

Programmes must include **one** strand, however, it is recommended that programmes include two strands to allow learners to gain a broader skill set.

It is recommended that programmes include a minimum of 400 practical hours within a realistic (in-house or public) industry or community setting. At least 150 hours is completed the learner's selected strand. The remaining hours can be applied within any role within the entertainment and event technology industry. Programmes must include participation in a range of entertainment and event types.

Programmes must include a minimum of four entertainment and event productions. All entertainment and event productions must have sufficient depth to give the learner the opportunity to consistently demonstrate achievement of the graduate profile outcomes.

Legislation

Programme learning and assessment must reflect current industry best practice and be carried out in accordance with the following as relevant:

- legislation including the Health and Safety at Work Act 2015;
- current industry best practice and industry guidelines (where available). This includes The Guide for Safe Working Practices in the New Zealand Theatre & Entertainment Industry, version 15 and Safe Rigging Practices for the Entertainment Industry in New Zealand, version 1 or replacements that supersede these guidelines, available on the Entertainment Technology New Zealand (ETNZ) website, https://etnz.org.
- Additional relevant guidelines available from the WorkSafe website, www.worksafe.govt.nz.

Diversity and inclusion

Programmes leading to this qualification must:

- influence equitable outcomes for all learners;
- honour ngā kaupapa o te Tiriti o Waitangi (the principles of the Treaty of Waitangi);
- Promote and value Māori traditional knowledge; perspectives of Pacific communities, and cultural and educational needs as identified by ākonga/learners;

Promote learning that exposes ākonga/learners to a range of cultural values and perspectives that include te ao māori and diverse world views.

Pre-requisite/Entry Conditions

There are no entry or prerequisite requirements for entry into this qualification. Industry have recommended that learners hold a current full driving licence prior to entering a programme of study. It is also recommended that learners who may be working at heights hold unit standard 17600 *Explain safe working practices for working at heights*, or can demonstrate equivalent knowledge and skills prior to engaging in learning.

Skills and Knowledge to be covered per Graduate Profile Outcome

Graduate Profile Outcome	Skills, knowledge and outcomes to be covered	Suggested unit standards
Core		
Implement industry practices, processes and protocols to work effectively as part of a crew and with other departments to meet performance or event requirements. Credits 15	- roles, practices and hierarchy of personnel in entertainment and event organisations; - team or group collaboration to achieve an objective; - relationship management with internal and external stakeholders; - application of a problem-solving model; Programmes must include production processes for a performance or event, including knowledge of planning requirements across different department and the impact on other departments.	- *30457 - Describe production process requirements and roles and responsibilities in the entertainment and event industry Level 4 Credits 10*
Maintain professional conduct and apply appropriate communication with a diverse range of internal and external stakeholders Credits 10	- knowledge and application of professional conduct and industry protocol requirements; - professional conduct and protocol requirements of internal and external stakeholders and crew; - responding to multiple customer expectations and deadlines; - written and oral communication.	- *30455 - Operate professionally, collaboratively and solve problems systematically in the entertainment and event industry Level 4 Credits 20*
Apply knowledge of employment types and professional development in the entertainment and event industry to manage own career. Credits 25	- the origins and use of theatre and event terminology; - technological advances in the industry; - description of business systems and financial responsibilities for employment in the entertainment and event industry; - requirements for people working in entertainment and event technology who are not employed by the venue including the self-employed, contractor, employee and volunteers; - self-promotion through evidence portfolio and scope of practice.	- *30456 - Demonstrate knowledge of worker responsibilities and professional development in the entertainment and event industry Level 4 Credits 10*
Implement safe working procedures and practices for entertainment or event productions. Credits 10	- implementing health and safety plans for a workplace including fire safety; - hazard identification and risk assessment plans and processes; - awareness of the safe use of electrical devices; - health and safety management requirements for people working on site; - site and venue access and safe loading in, installation and loading out of technical equipment.	- *30265 - Apply health and safety risk assessment to a job role Level 3 Credits 8* - *30266 - Demonstrate knowledge of workplace health and safety culture*

		and practices *Level 3 Credits 6* - *30268 - Monitor the health and safety performance of a team within an organisation* *Level 4 Credits 5*
Strands		
Entertainment Rigging Strand The level 4 technician, as with the other disciplines, can keep themselves safe and apply safe practices to maintain the safety of others. They can identify hazards, locate safety information, use equipment safely, understand the importance of load calculations for safe rigging and follow all safety guidelines and legislation. For arena and event rigging they need to understand truss science and terminology, the safe use of chain hoists and lifting appliances as well as rigging plan assembly and rigging science. For the theatre they need to understand theatre proprietary rigging systems, motors, winches and counterweight systems and the general operation under show conditions.		
Safely install, operate and remove rigging equipment to meet the production and rigging plan requirements for a range of complex performances and events. Credits 30	Technical skills must be demonstrated across a range of performances and events. - knowledge of operating systems, workflows and terminology for theatre and arena rigging systems; - interpreting plans and documents for theatre and arena rigging systems; - selecting and operating rigging equipment to meet the requirements of a rigging plan; - executing the rigging plan for a performance and/or event. - Safe working practices? - Packing out and transport?	- *30460 - Demonstrate knowledge of industry terminology, equipment and work practices for event and arena rigging systems* *Level 4 Credits 10* - *30461 - Install, operate and remove rigging equipment for a performance or event* *Level 4 Credits 20*
Lighting Strand Lighting technicians at Level 4 require a range of skills to be a valuable member of the lighting crew, electrical theory, knowledge of signal flow, electrical safety and guidelines, how to plot a simple event, understanding recording protocols and be able to use a range of different lighting fittings, fixtures and types. They need to understand the capability of the venue they're working in, control the lighting equipment and lighting desks and have some knowledge of the basic operation of a theatre or event.		
Safely install, operate and remove lighting equipment to meet the production and lighting plan requirements for a range of complex performances and	Technical skills must be demonstrated across a range of performances and events. - knowledge of the types, properties and use of lighting fixtures, effects, data distribution and control equipment for technicians in the entertainment and event technology industry;	- *30458 - Demonstrate knowledge of Explain* *Level 4 Credits 10* - *30459 - Install, operate and remove lighting*

events. Credits 30	- interpreting plans and documents for a lighting plan; - selecting and operating lighting equipment to meet the requirements of a lighting plan; programming a lighting console? - executing the lighting plan for a performance and/or event. - electrical power cabling, protection devices, safety requirements; - Removing and packing out lighting equipment.	*systems for performances or events* *Level 4 Credits 20*
Live Sound Strand At Level 4 sound technicians need to know their own standards and what a good sound is for the genre. They should have the operational knowledge required for the show as well as be able to interpret sound or technical riders. They need to allow for unexpected situations and not try to cover things up but find solutions and use dynamic troubleshooting.		
Safely install, operate and remove sound equipment to meet the production and sound plan requirements for a range of complex performances and events or a live recording. Credits 30	Technical skills must be demonstrated across a range of performances and events. - knowledge of the purpose and functions of equipment commonly used in live sound; - knowledge of signal flow and sound system requirements; - interpreting plans and documents for a sound plan; - selecting, installing and operating sound equipment to meet the requirements of a sound plan; - executing the sound plan including selecting and applying a range of techniques to improve sound quality during a performance or event or a live recording; - Remving and packing out sound system equipment.	- *30466 - Explain signal flow, sound system requirements and factors affecting performance or event sound quality* *Level 4 Credits 10* - *30467 - Install, operate and remove sound equipment for performances, events or a live recording* *Level 4 Credits 20*
Vision Strand The graduate profile outcomes for video technicians match the lighting outcomes the main difference being the equipment used. They need to know what the equipment is capable of and understand test bars, playback systems, and software and monitor calibration. Their equipment can be projectors, screens, laptops and they need to understand interfaces, projection surfaces, file formats, carriers and production documentation and the external influences on visual elements.		
Safely install, operate and remove video equipment to meet the production and video plan requirements for a range of complex performances and events. Credits 30	Technical skills must be demonstrated across a range of performances and events. - the purpose and characteristics of the commonly used components of a video system and video system signal flow; - knowledge of factors affecting video quality - interpreting plans and documents for a sound and video plan; - selecting, packing in and testing video equipment;	- *30470 - Explain equipment, components and video signal quality relating to video systems for performances or events* *Level 4 Credits 10* - *30471 - Select, install, operate and remove video*

	- operating video equipment including switcher, input and output equipment, to meet the requirements of a video system brief; - implementing a video system brief; - packing out video equipment.	*equipment for performances or events* *Level 4 Credits 20*
Stage Management Strand Stage Management skills are often soft skills that are difficult to document in a qualification or unit standard format, this includes maturity, emotional intelligence and remaining calm in all situations. Stage managers need to work with other disciplines and rarely in isolation, developing relationships with the production manager and other departments. They need to demonstrate an aptitude for making calls in high pressure situations. Distributing information, trouble shooting, problem solving, modifying, conflict resolution and multi-tasking are all highly sought after skills in stage managers. They also have to be sensitive to the performer aware of their needs and expectations. Where possible it's handy for stage managers to have a drivers licence, food preparation and safety certificate, even a gun licence.		
Implement stage management documentation and production process requirements to ensure the smooth running of a range of complex performances and events. Credits 30	Technical skills must be demonstrated across a range of performances and events. - the key components to stage manage a performance or event, including preproduction planning and preparation; - interpreting and preparing plans and documents for a performance or event; - stage managing the production rehearsal phase of a performance or event; - executing the stage management function for performances or events; - contributing to show reports and production archive.	- *30468 - Demonstrate knowledge of roles and responsibilities within the stage management team for performances or events* *Level 4 Credits 10* - *30469 - Perform a stage management role and produce documentation for all phases of performances or events* *Level 4 Credits 20*
Stage Mechanics Strand Stage mechanists work on stage, completing the set up for the show and the de-rig breakdown, often working in low light situations and confined spaces. They need to be able to manage stress and fatigue. Technicians work with mechanical and automated control systems and it's important they understand the two different parts to the stage mechanist role, construction mode and show mode. They have a direct relationship with the stage manager calling the show and the performer so they need to understand cues, use headsets and microphones and understand the needs of performers, modes of change and etiquette requirements.		
Safely set up, operate and remove scenery and stage mechanical devices to meet the production requirements for a range of complex	Technical skills must be demonstrated across a range of performances and events. - Knowledge of scenery, rigging and mechanical stage equipment; - safety and load ratings; - preparing and setting up machinery and scenic elements;	- *30464 - Demonstrate knowledge of scenery, rigging and mechanical stage equipment for performances or events* *Level 4 Credits 10*

performances and events. Credits 30	- interpreting plans and documents for scenery, mechanics and equipment on stage; - operating stage mechanical equipment and flying systems; - executing the staging requirements for a performance or event; - packing out machinery and scenic elements.	- *30465 - Prepare, set up, operate, and remove stage machinery and scenic elements for performances or events* *Level 4 Credits 20*
Scenic Construction Strand The scenic construction crew work together to complete a range of tasks depending on their level of skill and the tool box of techniques and processes they accrue as they become proficient technicians. At level 4 you need an understanding of who you're working with, how to work safely and the purpose and function of tools, equipment and materials for constructing scenery. Graduates require knowledge of digital technologies and 3D printing and their application in drawing and interpreting the designer's requirements.		
Construct stage scenery using a range of construction methods, equipment and digital technologies for a range of complex performances and events. Credits 30	Technical skills must be demonstrated across a range of performances and events. - knowledge of the purpose and suitability of components to construct stage scenery; - producing and interpreting plans and drawings for the construction of stage scenery; - operating tools and equipment to construct stage scenery, including the use of digital technologies such as computer aided design programmes, to meet the brief for a performance or event; - executing the construction of stage scenery for a performance and/or event.	- *30462 - Demonstrate knowledge of the drawings, materials and methods used to construct stage scenery for performances or events* *Level 4 Credits 10* - *30463 - Construct stage scenery for a performance or event* *Level 4 Credits 20*

Assessment Conditions/Process

Where possible, evidence of competence should be collected as naturally occurring evidence. For example, assessing a trainee while they are assisting with an event 'Pack In or Pack Out' is a great way to view competence at any level depending on the tasks being performed. Examples of naturally occurring evidence could be:

- Written evidence of where technological terms are used.
- Meeting minutes, emails, personal glossaries, job lists, task sheets, job descriptions, stage notes, event or performance log book, back stage task lists.
- Organisational structure diagrams, codes of conduct verification documents, induction information, safety tour information, uniform or dress standards,
- Rehearsal sheets, pack in pack out sheets.
- Stage plan, stage plots, masking information sheets, props list, prompt book.
- Rehearsal sheets, cue to cue, lighting rehearsals,
- Pack in, pack out information

- Technical Riders -diagrams and notes for technical information, AV, lighting, feature lists.
- Method Statements
- Rigging plans -diagrams and notes for rigging and stage mechanics, mother grids, load specifications
- Notification of hazardous work forms (Worksafe). No access area information.
- Lighting plans, lighting plots, lighting cue synopsis
- Sound plans and sound plots
- Signal flow diagrams
- Patch sheets
- Equipment lists, equipment testing sheets, PAT testing, etc. Maintenance schedules, test tags, venue or manufacturers requirement information, equipment safety labels. PPE equipment sheets, documentation for checking or removing defective equipment.
- Risk plans and schedules
- Theatre escape and rescue plans

Assessor Specific Requirements

It is recommended that rogrammes that have been developed using Toi Mai unit standards must meet the below assessor requirements. Programmes developed without unit standards are highly recommended to meet the below requirements as they have been developed by industry to reflect the expectation of those teaching and/or assessing learners.

To assess this qualification assessors must:

- Hold a current relevant industry qualification, in the same strand(s) and at, or preferably, one level above that which they will be assessing, or be able to demonstrate equivalent skills and knowledge (for recognised qualifications and equivalent skills and knowledge- see below list),
- Hold unit standard 4098 or 30421, or be able to demonstrate equivalent knowledge and skills
- keep up to date with legislative and technological requirements, and best industry practice of the sector.It is recommended that assessors hold a current first aid certificate.

Current recognised qualifications include:

- NZ Diploma in Entertainment and Event Technology (Level 6) with strands in Entertainment Rigging, Lighting, Live Sound, Video, Stage Management, Stage Mechanics and Scenic Construction
  PLUS:
  Min. 5 years logged experience in Entertainment and Event Technology in at least one strand at Diploma level 6,
  Or demonstrated equivalent skills and knowledge.
- NZ Certificate in Entertainment and Event Technology (Level 4) with strands in Entertainment Rigging, Lighting, Audio, Vision, Stage Management, Stage Mechanics and Scenic Construction
  Or demonstrated equivalent skills and knowledge.

Industry glossary of terms

There is a glossary of terms for the language used in the qualifications and unit standards. This can be found on ETNZ website: https://www.etnz.org/ETNZResources

Appendix 1: Unit Standard Support Material

GENERAL	
Pre-production process	vision, venue, expectations, requirements, objectives, themes, format, meetings, scale models, creation of budget and timelines, sourcing, manufacturing, and allocating resources -specifications, procurement of props and costumes, installation, programming, clearance, load in, loading onto stage, set construction, shifts, shift crew, painting scenery, sewing and costume repair, seating plans and layout, delivering, packing or setup - crew, resources, issues, props, ground plan, set construction, automation, curtains, blacks, prompt book, sightlines, cloth, set dressing, escape stairs, masking, marking out, on stage, off stage.
Pre-production rehearsals	direction, participants positioning, movement and blocking, experimentation, calls, devising.
Production process	cue to cue, technical rehearsal, technical dress rehearsal -crew, resources, issues, needs, curtain call, paper tech, piano dress, point cue, production desk, run through, cue synopsis.
Production process - pack out	load out - set tear down, props and costume return, rentals.
Post production archiving requirements	crew lists, resources, issues, needs, prompt, score, cue synopsis, digital files, plans , timelines and schedules, budgets, supplier information, show reports, successful outcomes, statistics, resource allocations, running times, audience numbers, cast issues, performance issues, post-show report, missed cues, hazards, audience issues, stoppages and interruptions, noise levels, wardrobe and stage malfunctions .
Supporting documentation	site drawings, site safety plans, site specific health and safety policy, hazard identification information, vehicle access management plans
Health & Safety requirements	personal safety, safety of the crew, equipment maintenance schedules, hazard plans, hazard identification, safe lifting practices, emergency procedures and plans, reporting hazards and accidents, restricted areas, notifications, personal limits, attending meetings, hygiene, fitness, fatigue, dehydration, tidiness, PAT testing, near miss incidents, insurance, hours of work, timing of breaks, concentration, being alert, complacency, own limitations, environment, working at height restrictions, peripheral vision, unusual or sudden noise
Confidentiality & Privacy	verbal or written information, personal or crew details, documents, plans, sketches, drawings, marketing strategies, research data, product literature, embargo, documents, technical information, production processes, know how, copyright, intellectual property (IP).

Compliance	notification, notifiable work, evacuation procedures, emergency exit routes, fire curtains, flame retardants, fire extinguishers, earthquake procedures, safe areas, seating, crowd control, occupation of buildings

RIGGING	
Rigging systems & equipment	slings, chains, ropes, bridles, pulleys, pull lifts, shackles, baskets, blocks, hoists, clamps, grips, o-rings, masterlinks, hooks, eyebolts, choke, lug, chocks and wedges, winches, spreader beams and equalising gear, rigging screws, tirfors, turn buckles, snatch blocks, bull dog clips, pin rails, tying off, sandbags, arbors, trim clamp, catenary line, spot line, drifts, stingers, mousing, screw gun, rigging blocks, sheaves, bearings, shaft, side plates, retainer, mounting device, head blocks, spot blocks, mule blocks, idler pulleys, sag bars, snatch blocks, rescue block, loft block
Counterweight & Fly rigging systems	counterweight, single purchase counterweight system, double purchase counterweight system, cradle (arbor), control line (rope), rail brake, idler block, head block, loft block, lift line, trim chain, flybar, barrel, batten (timber, truss, pipe, ladder), load limit, rigging points, fibre rope rigging systems, hand lines, counterweight rigging systems, single purchase, double purchase, blocks, locking, loading and unloading from the loading gallery, increasing capacity
Rope Construction	Natural or synthetic fibre and wire rope construction - three strand twist, tensile strength, manila rope, braided rope, wire rope construction, stand and wire configuration 7x7 and 6x19, fibre core, independent wire rope core (IWRC).
Stage terms	house curtain, stage curtain, lights, scenery, stage effects, in and out, cyclorama, brail, breast, bridle, guying, surge line.
Theatre Systems	fly system, theatrical rigging system, blocks and pulleys, counterweights, hoists, lifting tackle
Mechanised Rigging Systems	automated rigging system, hydraulic system, motorised winch fly system, direct drive winch system, chain hoists.
Flying System Components & Infrastructure	battens, lines, blocks, counterweights, cradles (arbors), hoists, winches, fly tower (loft), grid deck, loading gallery (bridge), fly gallery, pin rail, locking rail, cradle well (arbor pit), roof truss, catwalk, lighting bridge.
Motorised rigging systems	motorised winches, counterweight balanced loads, part balanced load, chain drive, wind on wind off system, power assist, traction drive, dead haul winch, drum winch, line shaft system, packaged hoist system, electric and hydraulic motor, closed and open loop control.
Lift apparatus	chain hoists, multi point hoisting, slings.

Site access equipment	fixed ladders, catwalks, fixed platforms, mobile elevated work platform (MEWP), access towers, wire rope ladders.
Slinging loads and calculations	strength of connection to the load, stability of the slung load, ratings, type of lift, appropriate use of a sling to wrap a truss, define choke and basket and the strengths and weaknesses.
Movement of loads	communication and signal methods, centre of gravity of load, access, obstacles, final resting place, design specifications, stability, use of load shifting equipment, use of rigging gear.
System load requirements	positive and negative forces, moment of force, resultant force bridle analysis, bridle length calculation, hanging points of different heights, horizontal force, vectors, moment theory or method, effects of bridles on hanging points, hanging lines on beams.
Manufacturers specifications	manufacturers' ratings, finite strength, failure, tensile force, compressive force, shear force, stress, yield point and elasticity, breaking point, allowable deflection, torsion, unpredictable forces, fatigue, shock loads.
Safety with fall protection systems	suitability, conditions, traceability, compatibility, security, anchorage, fit, age of equipment, clearance, selection.
Safety and safe work practice requirements	weight of load, weight of block and tackle, capacity of block and tackle, self weight of rigging equipment, working load limit (WLL), lead line pull (LLP), supporting member load capacity, total load on supporting member, load distribution, dynamic load, inertia and friction, mechanical advantage, total load on the system, attaching, operating, storage. Safety margins - factor of safety, degree of risk, known forces, strength reduction factors (SRF), derating, fatigue bending and abrasion, termination.
Safe use of types of ropes	allowable working load, knotting, bends and hitches, care of rope, balance, coiling and uncoiling, storing, dirt and dust, chemicals, overload, sharp bends, small sheaves, abrasion, shock load, humidity, visual inspection, rotating rope position, indentations, variations in colour, variation in diameter, broken internal strands, high strand, rot and mildew, age of the rope.
Safety with fibre rope and hand line rigging components	ropes and sandbags, ropes weighted with pipes, untying a line set, attaching load, removing loads, trim marks, yarn trim mark, tie off lashing, re trimming, coiling and dressing, show operation, tying knots, lock rail, rope lock, line lock, taping of tails, double purchase set, loft block positioning, head block positioning, fleet angle, aligning blocks, running rope, natural and synthetic splicing, whipping.

Method Statements	venue structural load capability, power supplies, known rigging points, previous production information, laser beam fire protection positions, hazard registers, notification to WorkSafe, arrival on site, briefing the crew, rigging crew numbers, people access, power access, stage access, access to roof space and catwalks, timeframes, transport requirements, hanging and hoisting times, lifting operations, insurance coverage limits, de rigging times and access, rigging equipment collection and loading times, access to loading dock, rigging certificates held, rigging plan compliance, standards of practice, professional conduct, rigging principles used, assessment of load, rigging plan checks, proof of inspection, safe use of bridles, correct attachment to building structures, safe use of self-climbing hoist chains, termination of steel wire ropes, electrical sign off requirements, safe use of slings and chains, type of truss and hardware used, risk assessment, range of methods, highlighting strengths and weaknesses, planning, adequate safety mechanisms, emergency procedures, delivery requirements, pack out requirements, storage on site, personal protective equipment (PPE) requirements
Working at height requirements	access to work at height, machine or mobile access equipment, off catwalk requirements, fall arrest equipment information, vertical fall equipment, use of appropriate anchors, support rigger, rescue training, first aid kit availability, unsecured tools and equipment, safety line systems, fixed anchorage points, truss walking safety guidelines, rescue planning
Selection of ropes, wire ropes and accessories	elasticity, elongation, flexibility, durability, handling characteristics, strength, reserve strength, abrasion resistance, size, core construction, classification, grades, uneven cable stretch, adjustment device, trim chain, safety bolt.
Truss science and requirements	safe load limits, load dimensions, centre of gravity, lift requirements, anchorage points, power and control cables, stability.
Selecting slings	load types may include but are not limited to - regular, irregular, overload, under load, uneven distribution, slippery, fragile, unstable, rough or sharp edge, environmental conditions may include but are not limited to - nearby heat source, moisture, sling construction materials include but are not limited to - chain, wire rope, polyester or nylon, other natural or synthetic fibres.
Common types of knots and hitches	bowline, reef knot, figure eight knot, clove hitch, round turn and two half hitches, rolling hitch, Italian hitch, sheet bend, bow, alpine butterfly.
Pre-use Checks	visual pre checks, safe working load markers, kinked or knotted wire, abrasions, damp, mildew, burns, friction marks, safety catches, safe working load checks, calculations, communications, de rating requirements, fire safety checks.
Secondary Suspensions	Excessive slack, material components, independent structural member, vertical rigging, safe practices, choking, protection materials.

Safe use of slings	type and condition, connection to the lifting equipment, mechanical action identified, cutting and pinching, centre of gravity, sling rating, compressive force, height of sling triangle, angle of the sling, fouling of chain bag or power cable, sling protection, avoidance of heat sources.
Safe use of bridles	dead hang, bridle angle, bridle leg tension, bridle force, suitability of supporting structure, dynamic loading, checking ready made bridles.
Rigging equipment & storage considerations	chemical, water damage, heat, mechanical damage, ultraviolet.

LIGHTING	
Luminaire	profiles, blinders, follow spots, fresnel, flood lights, plano convex, parcan, beamlight, cyc light, light emitting diodes (LED), luminaire data sheets.
Optics, fittings & Accessories	lamp, reflector, lens, lenses, focus point, gate, shutters, cables, barndoors, stands, strip lights, light meters, colour filter (Gel), gobo, shutter, iris, top hats, animation discs, rotators, animators, scrollers.
Lamps	incandescent, tungsten, halogen, 12, 24, 80, 120 or 240 volts, HID/discharge lamps, fluorescent lamps, construction, operation, colour temperature, lamp base type (bayonet cap, Edison screw), expected lamp life, Bi-plane filament, safe handling procedures, colour temperature, the relative efficiencies of the different types of lamp, and their pros and cons.
Interpreting lighting plans	selective visibility, revelation of form, focus, mood, location and time of day, projection, stage elements, plot or script, composition and design, mood, atmosphere, beams, area and wash.
Effect equipment	smoke machines, haze machines, fog machines, mirror ball, bubble machine, heavy fog machine, dry ice machine, strobes.
Moving lights	moving mirror, moving head, wash, profile, LED, discharge, tungsten, quality of fitting.
Patching requirements for the lighting plan	channel numbering, DMX addresses, multiple universe patching, multiple address patching, non-dim patching.
Instrument Schedule	quantity, type, wattage, use, colour media, accessories, rigging and plugging, connection requirements, dimmers, location and position, focus on stage, gobo, top hat, half hat, barndoor.
Lighting System Equipment	luminaires, dimmer pack, power source, cables, lighting desk, multicores and leads, plugs, access equipment, gobos, gel, digital multiplex (DMX) reticulation equipment, dimmers, lighting consoles, switch packs, DMX system, multicore patching, universes, power reticulation, patch panels, way lines.
Focussing techniques	panning, tilting spotting, zooming, adjusting doors and shutters, peaking.

Lighting console	manual pre-set, faders, crossfader, lighting state transition, speed, timing, record enable, editor, playback, effects, patch, remote focus unit, inputs, outputs, tracking, submaster, step time, in time, dwell time, down time, forward, reverse, bounce, build, random, groups, pre sets.
Groupings	colour, gobos, specials, upstage, downstage, effect and blinders.

AUDIO	
Conventions and formats	left to right, top to bottom, female and male connectors, 2 and 3 wire circuits, T connections, switches, headphones, snake, stage box, speakers, microphones, line amplifier, resistance, balanced and unbalanced output, reasons for using, labels, diagram key.
Input devices	dynamic microphones, condenser microphones, contact pickups, magnetic pickups, tape heads, laser pickups, optical pick ups
Output devices	output transducers - dynamic speaker, piezoelectric speaker, ribbon speaker, electrostatic speaker, compression driver, heil air motion transformer (AMT) speaker. Speakers - subwoofer, midrange, tweeter, front loaded, horn loaded, band pass, bass reflex, point source, line array, passive box, active box, wedge.
Components of a mixing desk	channel input, gain, equalization (EQ), auxiliary (aux), aux master, aux out, stage monitor mix, pan, master faders, front of house mix.
Components of audio perception	loudness, pitch, timbre, masking, ambient noise, the haas effect, temporary threshold shift, permanent hearing loss, sound pressure level (SPL) exposure.
Elements of sound signals	gain distortion, (THD and IMD), signal to nose ration, dynamic range, cross talk, frequency, phase, frequency and phase response, sound pressure level.
Sound Quality	reverberation times, reflection, absorption, diffusion, room dimensions and standing waves, resonant frequencies, changing audience numbers, the effects of temperature and humidity.
Equipment placement	audience coverage, uniformity of level and frequency response, loudspeaker directional pattern control, polar patterns, comb filtering and interference, stage bleed.
Mixing effects	reverb, delay, harmony, compression, limiting, gating, autotune.
Feedback control mechanisms	reduce gain, adjust EQ, adjust mic placement, swap out equipment.

VISION	
Equipment selection	inputs, computers, media servers, playback devices, cameras, maximising video quality, reducing video signal degradation, maximising bandwidth and screen resolution, reducing interface issues, correct screen output selection, requirements for cable length, required signal types, output devices, projectors, recorders, monitors, multi-image viewers, LED screens, flat panel screens, type of image, portability, resolution, format, contrast ratios, connectivity, type of venue
Characteristics of input devices	lens ratios, low light, audio connections, suitability to venue, formatting with monitors, depth of field, protocols, SDI, HDMI
Video signal flow diagram	senders, receivers, media servers, convertors, connectors, display devices, monitors, video production switcher, video scaler, router, test signal generator, radio frequency modulator, scan converter, waveform monitor, distribution amplifier, camera control units, cameras, projectors, multi-image viewer, video playback deck, character generator, record decks, encoders and decoders.
Switching & effects	sources, black, camera, colours, test bars, mix effect functions, mix or dissolve, dip, wipe, DVE, sting, timing of cues, trouble shooting, coping with changing demands and timelines.
Connectors, video signals and formats	serial digital interface (SDI) connectors, high definition multimedia interface (HDMI) connectors, digital visual interface (DVI), video graphics array (VGA) connector, Bayonet Neill-Concelman (BNC) connector, red green blue high definition visual (RGBHV), RGsB, composite, component, high definition (HD) component, phono connector.

STAGE MANAGEMENT	
Roles	stage manager, deputy stage manager, assistant stage manager, company manager, chaperone
Attributes of the stage management team	confidence, confidentiality, equanimity, multi-tasking, responsiveness, patience, humour, enthusiasm, versatility, self-motivating, inventiveness, self-governing, resilience, foresight, empathetic, approachable, clear communicator.
Behaviours	code of conduct, etiquette, perseverance, deliver constructive criticism, follow through, systematic approach to problem solving, adjusting to unexpected situations, time management.
Pre-rehearsal period	auditions, design meetings, rehearsal preparedness.
Rehearsal space mark out	orientation of stage to rehearsal room, entrances and exits, centre line, upstage, downstage, flown scenery, stage elements.
Courtesy calls	half hour call, house open, 15-minute call, 5-minute call, beginners, places, interval calls, calls to stage.

Stage Management Tasks	running a wing, calling the show, assisting with performers, assisting with scene changes and staging, maintaining production standards, maintaining a safe and healthy work environment, problem solving, escalating concerns to appropriate personnel, managing other personnel.
Stage Management Documentation	rehearsal reports, show reports, props setting/running lists, cross character plot, rehearsal cues, blocking notes, technical cues and notes, props notes, performer notes, actions, timings, performance notes, courtesy calls, prompt book, event guides, schedules, running lists, cue lists, cue plots, crew plots, venue signage, personnel lists, contact lists, casting lists
Show Reports	running times, performer notes, technical notes, repairs required, house numbers, company morale notes, audience response notes, accident and incident reporting.
Production resource book	casting lists, running lists, scripts, scores, props, set, lighting plots, sound plots, show reports, stage, markings, stage drawings, props setting diagrams, props purchase history, consumables lists, crew calls, venue notes, information relating to performers, staging, crew information, equipment, sound, lighting, set, props, costumes, venues, transportation.

SCENIC CONSTRUCTION	
Tools	battery and electric drills, drill press, circular saw, jig saw, angle grinder, router, biscuit joiner, drop saw, staplers and nail guns, appropriate hand tools.
Scenic Props	stairs, railings, rocks and trees, tables, chairs, false floors.
Construction Materials	plywood, medium density fibre board (MDF), balsa, particle board, finger jointed timber, rough sawn and gauged timber, muslin, velour, paper, cotton, scrim, canvas, netting, wool serge, calico, polystyrene, plaster, latex, plastics, acrylic, polyvinylchloride (PVC), fibreglass, cement renders, polyurethane, plant material, stones and rocks, sand, gravel.
Methods of connection	butt joint, lap joint, mitre joint, notched joint, scarf Joint, mortise and tenon joint, doweled joint, biscuit joint mig weld, tig weld, manual arc weld and gas welding.
Methods to secure assemble & suspend scenery	hinges, pins, metal fixing plates, brace, fasteners, adhesives, flying hardware.
Finishing Effects	glazing, embossing, rag rolling, marbling, stencilling, spattering, sponging, ageing, wet blending, gilding, sponge printing.

Design Considerations	location, period, mood, style, genre, equipment storage space, entrances and exits, collapsibility, stage dimensions, stage load limits, access to performance space, access to rehearsals, stage surface, rigging requirements, flying scenery, safety of performers, safety of audience, stage mechanics requirements, budget, touring and transport considerations.
Parameters for scale and standard of scenery	schedule of materials, assembly, installation, human resources, timeline, type and standard of finishing,
Drawing & Documentation	Stage plans and ground plans - position, size, masking requirements, sight lines, visibility, hand sketches, drawing board, computer software, component dimensions, position, size, shape, thickness, construction methods, scanned hand drawings, digital drawings, cut list, production drawings, notes, hanging plot, riders.

SCENIC CONSTRUCTION AND STAGE MECHANICS	
Items of scenery	hard and soft flats, masking flats, painted flats, 3 dimensional built-up set pieces, backcloth, masking cloth, backdrop, gauze , cyclorama, show cloth, translucent and opaque drops, scrim drops, cut out drops, draperies, masking borders, curtains, curtain runners, pelmets, blinds, café curtains, front cloth, venetians, drapes, tabs, swags, bobbinet nets, mosquito ne.
Flying & Moving Scenery	masking drapes, borders & legs, flown scenery, kabuki drop, flying system, revolve, trucks, stage traps, using hydraulics, pneumatics, electrics, mechanical, revolves, trap doors, flying scenery and props, trucks, moving platforms.

STAGE MECHANICS	
Interpretation of stage drawings	sight lines, setting line, drapes, centre line, proscenium line, stage dimensions, drift, stage side elevations, stage front elevations and plans.
Items of scenery	Stock scenery - doors, windows, platforms, rostra, flats, false floors, treads, Moving scenery equipment - trucks, hoists, revolves, stage traps, stage rigging, lifts, Specialist scenic elements - flats, ceilings, headers and other specific flown elements.
Manual scenery handling techniques	flats, trucks, rostra, drapes, floors and cloths.
Mechanical stage equipment	trucks, revolves, stage traps, lifts

Hand Line set up & operation	suspension structure or grid, ropes, pulleys, battens, tie off rails, rigging tackle, load rating, knots, attached load, industry best practice, tying off, line of site, communication, calls.
Counterweight flying system set up	load ratings, attached load, counterweight loading, communication, deads, current industry practice.
Winch system components & set up	suspension structure or grid, manual winches, powered winch systems, rigging tackle, wire ropes, pulleys, battens, control equipment, load ratings, attached load, communication, deads, industry best practice, procedures.
Masking	hard flats, legs, borders, tab track, cyclorama, gauzes, cloths.