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CBT CURRICULUM

National Vocational Certificate Level 4

Version 1 - April, 2019



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Introduction

Furniture industry is mainly originated from n Gujrat, since the era of Sikandar-e-Azam (The Great Alexander). With the passage of time it has developed to make it pioneer and still leading in furniture manufacturing in one or another way with a steady production and exports. Gujrat is also considered as City of Furniture. Its wide scope, importance, demand, urbanization, elegance is now growing in various areas of Pakistan especially in Karachi, Lahore, Azad Jammu & Kashmir, Peshawar, Rawalpindi, Chiniot, Hunza etc. With changes in designs and trends in Pakistan as well as around the globe; furniture industry looks forward to adopt latest manufacturing techniques and technology and tap the needs of export market. Industry requirement for educated and skilled workforce is increasing which can only be managed through setting relevant competency standards in collaboration with the leading industries. Being cognizant of this fact, National Vocational & Technical Training Commission (NAVTTTC) developed competency standards for Furniture Technician under National Vocational Qualifications Framework (NVQF). These competency standards have been developed by a Qualifications Development Committee (QDC) and validated by the Qualifications Validation Committee (QVC) having representation from the leading furniture manufacturing companies of the country under the platform of All Pakistan Furniture Makers Association (APFMA) and Technical Education & Vocational Training Authority (TEVTA).

A Furniture Technician is a tradesman who specializes in making wooden and metal furniture. This person is competent in preparing, joining and assembling wooden furniture components, applying upholstery, applying surface aesthetics including carving and marquetry manually utilizing hand tools / general machines as well as on CNC machines and perform finishing operations. Moreover, this person is able to prepare basic metal furniture, apply paint and powder coatings on metal furniture. The Furniture Technician is also able to develop drawings of furniture and its components manually as well as on CAD/CAM tools. The Furniture Technician will not only be hired by furniture manufacturers but he can also be able to start his own business.

Definition/ Description of the training Programme for *Furniture Technician*

The Furniture Technician Programme is to engage young people for the development of furniture manufacturing which will provide them with the knowledge, skills and understanding to start their career in Pakistan. The Programme has been developed to address specific issues, such as the national, regional and local requirements as per designs, the manpower availability within the country, meeting & exceeding the needs and expectations of their customers.

Date of Validation

The Curriculum Document is validated by Qualification Validation Committee on 12th November, 2019 in Islamabad.

Purpose of the Furniture Technician Programme

The purpose of this Programme is to set high professional standards for furniture industry considering the following objectives of developing these qualifications are as under:

- Improve the professional competence of the trainees
- Shift from informal and non-formal to formal technical and vocational training
- Provide opportunities for recognition of skills attained through non-formal or informal pathways
- Improve the quality and effectiveness of training and assessment for furniture sector
- Enable the existing workforce to capacitate themselves in new technologies and methods

Overall objectives of training Programme

The overall objectives of the Furniture Technician Programme are:

- Managing a wood workshop
- Selecting tools, machines, hardware and equipment used to saw, cut, join, and develop aesthetics on the wood & allied material.
- Measuring and drawing accurately as per design requirements
- Fabricating the different furniture articles from metals
- Finishing the furniture article by employing the latest polishing material and techniques
- Experiencing the latest techniques used to carve, upholster or cane the furniture articles
- Develop drawings & employing the advanced CNC machines to manufacture various parts of the furniture
- Working effectively and safely

Competencies to be gained after completion of course

After completing the course, the trainee will have attained the following competencies:

- Maintain the safe working environment

- Coordinate and work with the team
- Prepare reports of various section to manage work
- Supervise the furniture manufacturing operations
- Prepare Basic & advance joinery
- Prepare different wooden parts on woodworking machines
- Prepare & use the templates, jigs and fixtures as per requirement of the job
- Prepare different marquetry patterns as per design
- Prepare different carving patterns as per design
- Fabricate the metal furniture parts utilizing the appropriate machines
- Understand and application of different welding techniques
- Understand and application of basic and advance machine operations
- Understand and draw furniture drawing using CAD software
- Understand and operate CNC machines to process various operations
- Maintain production of furniture items
- Finish a completed furniture item using different polishing materials applying various techniques

Possible available job opportunities available immediately after Level 4

Furniture technicians are employed in factories, schools, Government offices, manufacturing hubs inland and abroad, and personal endeavors. Experienced furniture technicians may advance through promotions with the same employer or by moving to more advanced positions with other employers. They can become:

- Supervisor production
- Production Manager
- Design Assistant
- Furniture Designer
- CAD/CAM operators
- CAD/CAM management
- General Managers.
- Foreman Workshop

Trainee entry level

QUALIFICATION TITLE	ENTRY REQUIREMENTS
National Vocational Certificate Level 4 in Furniture Technician (CAD/CAM Operator) (0722 CFT 011)	The entry requirement for this qualification is National Vocational Certificate Level 3 in Furniture Technician (Finisher) or equivalent or middle with 1 year work experience. The entry for assessment of this qualification is not specified.

Minimum qualification of trainer

F.A/ F.Sc./ D.A.E./ Certificate in Cabinet Making/ Woodworking/ Carpenter with minimum 6 year working experience in the relevant field.
(Advance studies of relevant field is preferable)
Bachelors in science/technology/engineering + Certificate in Cabinet Making/Woodworking/Carpenter with minimum 3.5 years' experience in the relevant field

Recommended trainer: trainee ratio

The recommended maximum trainer: trainee ratio for this Programme is 1 trainer for 10-15 trainees.

Medium of instruction i.e. language of instruction

An appropriate mixture of English and Urdu may be used to ensure understanding of technical terms and aid students in potential jobs abroad.

Duration of the course (Total time, Theory & Practical time)

Total duration of the course is 2 Years consists of 120 credits including 24 credits of theory, 96 credits of practical training.

Competency Standards	Theory Hours	Workplace Hours	Total hours
Module 1: Contribute to Work Related Health and Safety (WHS) Initiatives			30
Module 2: Analyze Workplace Policy and Procedures			30
Module 3: Perform Advanced Communication			30
Module 4: Develop Advance Computer Application Skills			40
Module 5: Manage Human Resource Services			20
Module 6: Develop Entrepreneurial Skills			30
Module 7: Develop drawings of furniture products using CAD/CAM	28	112	140
Module 8: Apply surface aesthetics using CNC Machines	38	152	190

Sequence of the modules

This qualification is made up of 11 modules. Eleven modules relate to drawing, sawing wood & boards, initial processing, joinery, finishing and working on computer numerical controlled machines. A suggested distribution of level 4 modules is presented overleaf.

This level involves the highly advanced modules to add to the skills of the learners of furniture technician: Module 10: Develop drawings of furniture products using CAD/CAM; Module 11: Apply surface aesthetics using CNC Machines. These comprise the highly advanced skills used now a days Worldwide. This will enhance the trainee observation and imagination beyond the borders of manual work.

Each module covers a range of learning components. These are intended to provide detailed guidance to teachers (for example the Learning Elements component) and give them additional support for preparing their lessons (for example the Materials Required component). The detail provided by each module will contribute to a standardized approach to teaching, ensuring that training providers in different parts of the country have clear information on what should be taught. Each module also incorporates the cultural background of Pakistan, including the woods and board material widely used for furniture manufacturing that make this qualification unique to Pakistan's needs.

The distribution table is shown below for level 4. The distribution table is shown below:

National Vocational Certificate Level 4 in Furniture Technician (CAD/CAM Operator)	
10. Develop drawings of furniture products using CAD/CAM (072200898)	11. Apply surface aesthetics using CNC Machines (072200899)

Summary – overview of the curriculum

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 1: Contribute to Work Related Health and Safety (WHS) Initiatives	LU1. Contribute to initiate work-related health and safety measures LU2. Contribute to establish work-related health and safety measures LU3. Contribute to ensure legal requirements of WHS measures LU4. Contribute to review WHS measures LU5. Evaluate the organization's WHS system	6	24	30
Module 2: Analyze Workplace Policy and Procedures	LU1. Manage work timeframes LU2. Manage to convene meeting LU3. Decision making at workplace LU4. Set and meet own work priorities at in stent LU5. Develop and maintain professional competence LU6. Follow and implement work safety requirements	6	24	30
Module 3: Perform Advanced Communication	LU1. Demonstrate professional skills LU2. Plan and Organize work LU3. Provide trainings at workplace	6	24	30
Module 4: Develop Advance Computer Application Skills	LU1. Manage Information System to complete a task LU2. Prepare Presentation using computers LU3. Use Microsoft Access to manage database LU4. Develop graphics for Design	8	32	40

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 5: Manage Human Resource	LU1. Determine strategies for delivery of human resource services LU2. Manage the delivery of human resource services LU3. Evaluate human resource service delivery LU4. Manage integration of business ethics in human resource practices	4	16	20
Module 6: Develop Entrepreneurial Skills	LU1. Develop a business plan LU2. Collect information regarding funding sources LU3. Develop a marketing plan LU4. Develop basic business communication skills	6	24	30
Module 7: Develop drawings of furniture products using CAD/CAM (072200898) Aim: The aim of this module is to develop advanced knowledge, skills and understanding needed develop drawings of furniture products using CAD/CAM.	LU1: Draw 2D Multiview drawing of Furniture Components on CAD LU2: Develop 3D model of Furniture Components LU3: Convert CAD drawing into CAM Code	14	28	112

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
<p>Module 8: Apply surface aesthetics using CNC Machines (072200899)</p> <p>Aim: The aim of this module to develop advanced knowledge, skills and understanding needed to apply surface aesthetics using CNC machines</p>	<p>LU1: Perform Turning of components on CNC Turning Centre</p> <p>LU2: Perform Carving on CNC Machining Centre</p> <p>LU3: Perform Marquetry/Parquetry on CNC Laser Machine</p>	38	152	190

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Module-1
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Modules

Module 1: Contribute to Work Related Health and Safety (WHS) Initiatives

Objective: This unit describes the skills and knowledge required to manage the identification, review, development, implementation and evaluation of effective participation and consultation processes as an integral part of managing work health and safety (WHS).

Duration: 30 Hours

Theory: 06 Hours

Practice: 24 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Contribute to initiate work-related health and safety measures	The trainee is able to: <ul style="list-style-type: none"> • compile database on work-related health and safety • Identify measures that address legal obligations. • Consult with individuals/ parties to formulate measures and initiatives • Consult with individuals/parties to 	•	•	•	•

	<p>identify factors impacting on work-related health and safety</p> <ul style="list-style-type: none"> • Participate in consultative meetings. 				
<p>LU2. Contribute to establish work-related health and safety measures</p>	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Assist in planning of work-related health and safety measures • Contribute to the development of work-related health and safety measures • Identify to implement work-related health and safety measures i.e. <ul style="list-style-type: none"> • resourcing requirements, • timelines • responsibilities • Assist to implement 	•	•	•	•

	<p>work-related health and safety measures and initiatives i.e.</p> <ul style="list-style-type: none"> • scheduling • liaison • administering resources • communication 				
<p>LU3. Contribute to ensure legal requirements of WHS measures</p>	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Identify WHS legal requirements • Apply knowledge of all aspects of WHS measures to • Consultation • workplace policies • participation processes • Ensure, WHS measures are in accordance with legal requirements 	•	•	•	•

<p>LU4. Contribute to review WHS measures</p>	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Develop effective practices to review work-related health and safety measures • Assist individuals and parties related to WHS measures in following activities • preparing reports • communicating review • evaluating outcomes 	•	•	•	•
<p>LU5. Evaluate the organization's WHS system</p>	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Assess ongoing compliance with OHS (Occupational Health and safety) • Take feedback from concerned persons regarding WHS measures. • Assess the overall effectiveness of WHS 	•	•	•	•

	<p>management practices</p> <ul style="list-style-type: none"> • Assist the development process of WHS measures in following ways • Suggest amendments • Document amendments • Implement amendments • Take feedback from concerned persons regarding WHS measures. • Communicate improvements in WHS Measures 				
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Module-2
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Module 2: Analyze Workplace Policy and Procedures

Objective: This unit describes the skills and knowledge required to implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.

Duration: 30 Hours

Theory: 06 Hours

Practice: 24 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Manage work timeframes	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Complete work tasks within deadlines in according to order of priority • Supervisors are informed of any delays in work times or projects 	•	•	•	•
LU2. Manage to convene meeting	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Develop agenda in line with meeting purpose • Select participants and 	•	•	•	•

	notify them accordingly <ul style="list-style-type: none"> • Carryout meeting arrangements according to the time • Record the minutes of the meeting 				
LU3. Decision making at workplace	The trainee is able to: <ul style="list-style-type: none"> • 	•	•	•	•
LU4. Set and meet own work priorities at instant	The trainee is able to: <ul style="list-style-type: none"> • Take initiative to prioritize and facilitate competing demands to achieve organizational goals and objectives • Use technology efficiently and effectively to manage work priorities and commitments • Maintain appropriate work-life balance 	•	•	•	•
LU5. Develop and maintain	The trainee is able to:	•	•	•	•

<p>professional competence</p>	<ul style="list-style-type: none"> • Assess personal knowledge and skills against competency • Participate in networks to enhance personal knowledge, skills and work relationships • Seek feedback from employees, clients and colleagues to develop and improve competence 				
<p>LU6. Follow and implement work safety requirements</p>	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Identify and report emergency incidents • Practice organizational policy and procedures for responding to emergency incidents • Identify and implement workplace procedures and work instructions for controlling risks 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

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Module-3
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Module 3: Perform Advanced Communication

Objective: This unit describes the performance outcomes, skills and knowledge required to develop communication skills used professionally. It covers plan and organise work and conduct trainings at workplace, along with demonstrating professional skills independently.

Duration: 30 Hours

Theory: 06 Hours

Practice: 24 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Demonstrate professional skills	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Use different modes of communication to communicate • Speaking • Reading • Writing • Listening • Presentation • visual representation etc • Develop CV Skills according requirements • Upgrade professional skills by attending 	•	•	•	•

	<p>trainings, webinars, conferences etc.</p> <ul style="list-style-type: none"> • Perform Continuous professional development as required at workplace • Develop interview skills 				
LU2. Plan and Organize work	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Identify task requirements. • Plan steps to complete tasks. • Review planning and organizing process. • Organize work. 	•	•	•	•
LU3. Provide trainings at workplace	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Assess the need for training • Prepare trainees for the learning experience • Present training session • Support trainees in managing their own learning • Facilitate group learning • Provide opportunity for practice • Provide feedback on progress on trainees • Review delivery experience 	•	•	•	•

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Module-4
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Module 4: Develop Advance Computer Application Skills

Objective: This unit provides an overview of Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards, i.e. Data Entry, Power Point Presentation and managing data base and graphics for Design

It applies to individuals employed in a range of work environments who need to be able to present a set range of data in a simple and direct forms

Duration: 40 Hours

Theory: 08 Hours

Practice: 32 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Manage Information System to complete a task	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Perform Data Entry in MS office • Manage File/folder in MS office • Perform Scanning of document • Maintain Office Record in drives • Perform Printing of document • Search required Files/Folders 	•	•	•	•

	<ul style="list-style-type: none"> • Convert Files in required format. • Manage sizes of Files/Folders • Compress • Zip /unzip 				
LU2. Prepare Presentation using computers	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Prepare presentation as per requirements, i.e. • Open blank presentation and add text / graphics • Create a simple design for a presentation • Apply existing styles within a presentation • Use presentation template and slides to create a presentation • Use various tools to 	•	•	•	•

	<p>improve the look of the presentation</p> <ul style="list-style-type: none"> • Save presentation to the appropriate storage device and folder with required name • Customize basic settings to meet user requirements • Format presentation as require • Develop organizational charts • Add objects and manipulate to meet presentation purposes • Modify slide layout, including text and colours, to meet presentation requirements • Save presentation in 				
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	<p>another format</p> <ul style="list-style-type: none"> • Save to storage device and close presentation • Add slide show effect into presentation as required to enhance the presentation • Incorporate pre-set Animation • Apply Multimedia effects • Record Narration • Apply hyperlink • Apply video • Rehearse Timings • Test presentation for overall effect • Print the presentation • Select appropriate print format for presentation • Select preferred slide 				
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	<p>orientation</p> <ul style="list-style-type: none"> • Add notes and slide numbers • Preview slides and run spell check before presentation • Print selected slides and submit presentation to appropriate person for feedback • Practice verbal presentation • Practice presentation through AV Aids 				
<p>LU3. Use Microsoft Access to manage database</p>	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Collect the data using a standard data base package. • Start access to manage database .i.e. • identify problem statement of Data 	•	•	•	•

	<ul style="list-style-type: none">• Develop a table with fields /attributes according to database usage/ user requirements• Create a primary key and establish an index for each table• Modify table layout and field attributes as required• Create a relationship between the two tables• Add data in a table according to information requirements• Add records as required• delete records as required				
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	<ul style="list-style-type: none">• Save database to storage area• close down database to storage area• Apply criteria in the following Query• SQL view of Query• Wildcards of query• Query Criteria• Customize basic settings:• Adjust page layout to meet user requirements• Open and view different toolbars• Format font as appropriate for the purpose of the database entries• Create reports• Design reports to				
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	<p>present data in a logical sequence</p> <ul style="list-style-type: none">• Modify reports to include or exclude additional requirements• Distribute reports to appropriate person in a suitable format• Create forms• Use a wizard to create a simple form• Open existing database and modify records through a simple form• Rearrange objects within the form to accommodate information requirements				
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<p>LU4. Develop graphics for Design</p>	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Develop graphic design concepts based on a thorough understanding of the communication need • Use design techniques confidently to produce designs • Integrate design tools skillfully to produce designs • Evaluate the success of completed designs to meet objectives • evaluate feedback from client / peers 	<p>•</p>	<p>•</p>	<p>•</p>	<p>•</p>
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Module-5
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Module 5: Manage Human Resource

Objective: This unit describes the skills and knowledge required to plan, manage and evaluate delivery of human resource services, integrating business ethics. It applies to individuals with responsibility for coordinating a range of human resource services across an organization. They may have staff reporting to them.

Duration: 20 Hours

Theory: 04 Hours

Practice: 16 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Determine strategies for delivery of human resource services	<p>The trainee is able to:</p> <ul style="list-style-type: none"> Analyze business strategy and operational plans to determine human resource requirements Review external business environment that likely impact on organization's human resource requirements Consult line and senior managers to identify human resource needs in 	•	•	•	•

	<p>their areas</p> <ul style="list-style-type: none"> • Review organization's requirements for diversity in the workforce • Deliver human resource services that comply with business goals • Develop strategic action plan for delivery of human resource services • Develop roles and responsibilities of human resource team • Develop quality assurance policy 				
LU2. Manage the delivery of human resource services	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Communicate human resource strategies and services to internal and external 	•	•	•	•

	<p>stakeholders</p> <ul style="list-style-type: none"> • Develop and negotiate service agreements between • The human resource team, • Service providers • Client groups • Document service specifications, performance standards and timeframes • Document /communicate service • Specifications, • Performance standards • Timeframes • Monitor Quality assurance processes • Ensure that services 				
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	<p>are delivered by appropriate providers, according to service agreements and operational plans</p> <ul style="list-style-type: none"> Identify underperformance of human resource team or service providers 				
LU3. Evaluate human resource service delivery	<p>The trainee is able to:</p> <ul style="list-style-type: none"> Establish Management information system for human resource services Conduct survey to determine level of satisfaction Analyze feedback of survey Recommend changes to service delivery 	•	•	•	•

	<ul style="list-style-type: none"> • Support agreed change processes across the organization 				
LU4. Manage integration of business ethics in human resource practices	The trainee is able to: <ul style="list-style-type: none"> • Ensure ethics in personal behavior • Ensure code of conduct is observed across the organization, • Observe confidentiality requirements in dealing with all human resource information • Deal promptly with unethical behavior • Ensure all persons responsible for human resource functions understand requirements regarding their ethical behavior 	•	•	•	•

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Module-6
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Module 6: Develop Entrepreneurial Skills

Objective: This Competency Standard identifies the competencies required to develop entrepreneurial skills, in accordance with the organization’s approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding funding sources, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be sufficient to provide you the basis for your work.

Duration: 30 Hours

Theory: 06 Hours

Practice: 24 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Develop a business plan	<ul style="list-style-type: none"> • The trainee is able to: <ul style="list-style-type: none"> • Conduct a market survey to collect following information • Customer /demand • Tools, equipment, machinery and furniture with rates • Raw material • Supplier • Credit / funding sources • Marketing strategy 	•	•	•	•

	<ul style="list-style-type: none"> • Market trends • Overall expenses • Profit margin • Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses • Compile the information collected through the market survey, in the business plan format 				
LU2. Collect information regarding funding sources	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate • Choose the best available option according to investment requirement 	•	•	•	•

	<ul style="list-style-type: none"> • Prepare documents according to the loan agreement requirement • Include the information of funding sources in the business plan 				
LU3. Develop a marketing plan	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Make a marketing plan for the business including product, price, placement, promotion, people, packaging and positioning • Include the information of marketing plan in the business plan 	•	•	•	•
LU4. Develop basic business communication skills	<p>The trainee is able to:</p> <ul style="list-style-type: none"> • Communicate with internal customers e.g.: labor, partners and external 	•	•	•	•

	<p>customers e.g.: suppliers, customers etc., using effective communication skills</p> <ul style="list-style-type: none">• Use different modes of communication to communicate internally and externally e.g.: presentation, speaking, writing, listening, visual representation, reading etc.• Use specific business terms used in the market				
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Module-7
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Module 7: Develop drawings of furniture products using CAD/CAM

Objective of the module: The aim of this module is to develop advanced knowledge, skills and understanding needed develop drawings of furniture products using CAD/CAM.

Duration: 140 Hours **Theory:** 28 Hours **Practical:** 112 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Draw 2D Multiview drawing of Furniture Components on CAD	The trainee will be able to: <ul style="list-style-type: none"> Develop component and size chart of the furniture as per product design Prepare drawing canvass in CAD software Draw 2D Multiview of the components as per required measurements Apply Hatches on the drawing to identify component material and Upholstery Draw symbols on the drawing to identify 	<ul style="list-style-type: none"> Introduction to CAD/ AutoCAD (Interface) Introduction to 2D drawing Understanding of drawing limits, units & scales Introduction and working with layers in AutoCAD Introduction to 2D drawing tools & commands in AutoCAD Introduction to short Keys in AutoCAD Introduction to various views (Multiview, Isometric, Section etc.) Introduction to basic geometrical shapes (Square, Polygons, Circles etc.) Application of allied operational 	Total 60 Hours Theory: 12 Hours Practical: 48 Hours	Computer System (As per software requirements) Software CD's Multimedia Projector Projection Screen	Theory & Practical Computer Lab

	<p>hardware</p> <p>Mention all dimensions on the drawing</p>	<p>commands</p> <ul style="list-style-type: none"> • Application of dimensions styles in drawing. • Understanding of hatch patterns & their application • Introduction to drawing sheet preparation (Drafting, Material, Assembly sheet etc.) 			
<p>LU2:</p> <p>Develop 3D model of Furniture Components</p>	<p>The trainee will be able to:</p> <ul style="list-style-type: none"> • Extrude component drawings into 3D models • Save CAD drawings in required file format • Print CAD drawings as per required scale 	<ul style="list-style-type: none"> • Introduction to 3D drawing • Introduction and working with layers in AutoCAD • Introduction to 3D drawing tools & commands in AutoCAD • Introduction to 3D shapes (Pyramids, Spheres, Cones, Torus etc.) • Application of 3D operational commands (Extrusion, Joining, Subtraction, Align etc.) • Introduction to material application, Wireframe & rendering of 3D objects • Introduction to Plot setting & printing 	<p>Total</p> <p>50 Hours</p> <p>Theory:</p> <p>10 Hours</p> <p>Practical:</p> <p>40 Hours</p>	<p>Plotter</p> <p>Laser Printer</p> <p>Drawing sheets</p> <p>Drawing Roll</p>	<p>Theory & Practical</p> <p>Computer Lab</p>
<p>LU3:</p> <p>Convert CAD drawing into CAM Code</p>	<p>The trainee will be able to:</p> <ul style="list-style-type: none"> • Create a Layer in your DWG file for 	<ul style="list-style-type: none"> • Introduction to CAM/CNC • Introduction to Layer creation • Understanding slicing 3D objects for CAM/CNC • Preparation of drawing format for CAM/CNC (Flatten, Overkill, 	<p>Total</p> <p>30 Hours</p> <p>Theory:</p> <p>06 Hours</p>	<p>CNC workstation</p> <p>CAM software</p> <p>CNC Tools (Bits, cutters etc.)</p> <p>Practice materials</p>	<p>Theory & Practical</p> <p>Computer Lab</p>

	<p>CNC paths and copy the relevant geometry onto it</p> <ul style="list-style-type: none"> • Prepare drawing for CAM (Flatten, Overkill, convert splines and ellipses into arcs and polylines etc.) • Extract the CAD drawing to CAM or CNC programme as per process requirements • Select appropriate machining tools in CAM module • Run simulation of CNC program to ensure desired results <p>Save CNC program in desired format.</p>	<p>convert splines and ellipses into arcs and polylines etc.)</p> <ul style="list-style-type: none"> • Extracting the CAD drawing to CAM/CNC program • Introduction to appropriate tool selection in CAM/CNC • Understanding and execution of simulation of CAM/CNC programme 	<p>Practical: 24 Hours</p>	<p>(Wood, boards etc.)</p>	
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FURNITURE TECHNICIAN



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Module-8
CBT CURRICULUM
National Vocational Certificate Level 4

Version 1 - April, 2019

Module 8: Apply surface aesthetics using CNC Machines

Objective of the module: The aim of this module to develop advanced knowledge, skills and understanding needed to apply surface aesthetics using CNC machines

Duration: 190 Hours **Theory:** 38 Hours **Practical:** 152 Hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Perform Turning of components on CNC Turning Centre	The trainee will be able to: <ul style="list-style-type: none"> Equip CNC Turning Centre with required tools Align work piece on the machine Execute machine program from control panel for required operation 	<ul style="list-style-type: none"> Introduction to CNC turning centre Understanding of specific machine safety Introduction to tools and equipment used for furniture making on CNC turning centre Introduction to loading the work piece on machine Understanding of proper alignment between centres 	Total 50 Hours Theory: 10 Hours Practical: 40 Hours	CNC turning Centre Wooden blocks Turning tools (bits, wheel etc.)	Theory Classroom Practical Workshop (20 hours training in industry is mandatory)

<p>LU2:</p> <p>Perform Carving on CNC Machining Centre</p>	<p>The trainee will be able to:</p> <ul style="list-style-type: none"> • Equip CNC Machining Centre with required tools (Bits, profile cutters etc.) • Align work piece on the machine • Execute machine program from control panel for required operation 	<ul style="list-style-type: none"> • Introduction and capabilities/limitations of CNC machining centre • Understanding of safety measures & basic trouble shooting • Understanding of various axis • Understanding of tools and equipment used on CNC machining centre • Understanding of calibration, homing and machine interface • Understanding of clamping devices • Understanding of execution process 	<p>Total</p> <p>80 Hours</p> <p>Theory:</p> <p>16 Hours</p> <p>Practical:</p> <p>64 Hours</p>	<p>Product pieces</p> <p>CNC workstation along with all accessories</p> <p>Profiles & Bits</p> <p>Cutters</p> <p>Aggregates</p> <p>Dust collection unit with all accessories</p>	<p>Theory</p> <p>Classroom</p> <p>Practical</p> <p>Workshop</p> <p>(30 hours training in industry is mandatory)</p>
<p>LU3:</p> <p>Perform Marquetry/Parquetry on CNC Laser Machine</p>	<p>The trainee will be able to:</p> <ul style="list-style-type: none"> • Align multiple veneer sheets as per machine capacity • Execute machine program from control panel for required operation 	<ul style="list-style-type: none"> • Introduction to CNC Laser machine (types of lasers) • Understanding of various applications of CNC laser • Understanding of safety measures • Understanding of various axis • Understanding of tools and equipment used on CNC laser machine • Understanding of calibration, homing and machine interface • Understanding of alignment and clamping devices • Understanding of execution process 	<p>Total</p> <p>60 Hours</p> <p>Theory:</p> <p>12 Hours</p> <p>Practical:</p> <p>48 Hours</p>	<p>Product pieces</p> <p>CNC Laser Machine</p> <p>Laser Tube</p>	<p>Theory</p> <p>Classroom</p> <p>Practical</p> <p>Workshop</p> <p>(20 hours training in industry is mandatory)</p>

General assessment guidance for (*Furniture Technician*)

Good practice in Pakistan makes use of sessional and final assessments, the basis of which is described below. Good practice by vocational training providers in Pakistan is to use a combination of these sessional and final assessments, combined to produce the final qualification result.

Sessional assessment is going on all the time. Its purpose is to provide feedback on what students are learning:

- to the student: to identify achievement and areas for further work
- to the teacher: to evaluate the effectiveness of teaching to date, and to focus future plans.

Assessors need to devise sessional assessments for both theoretical and practical work. Guidance is provided in the assessment strategy

Final assessment is the assessment, usually on completion of a course or module, which says whether or not the student has "passed". It is – or should be – undertaken with reference to all the objectives or outcomes of the course, and is usually fairly formal. Considerations of security – ensuring that the student who gets the credit is the person who did the work – assume considerable importance in final assessment.

Methods of assessment

For lessons with a high quantity of theory, written or oral tests related to learning outcomes and/ or learning content can be conducted. For workplace lessons, assessment can focus on the quality of planning the related process, the quality of executing the process, the quality of the product and/or evaluation of the process.

Methods include direct assessment, which is the most desirable form of assessment. For this method, evidence is obtained by direct observation of the student's performance.

Examples for direct assessment of a Furniture Technician include:

- Work performances, for example cutting a curve or circle on various machines, making profiles on wooden pieces, make a carving pattern on wood piece, preparing a job report,
- Demonstrations, for example demonstrating advanced cutting, planing methods, profiling methods, marquetry, carving, finishing techniques
- Direct questioning, where the assessor would ask the student why he is using the current material for the said job, or how the student prepare job in current sizing, how a job can be performed using various techniques including the future trends
- Paper-based tests, such as multiple choice or short answer questions on material management, machine operations, hand tools, finishing, Metal fabrication, upholstery, marquetry, carving, CAD/CAM operations or developing productive working relationships with associates.

Indirect assessment is the method used where the performance could not be watched and evidence is gained indirectly.

Examples for indirect assessment of a Furniture Technician include:

- Work products, such as a completed furniture article
- Workplace documents, such as a list of materials being used in developing the product.

Indirect assessment should only be a second choice. (In some cases, it may not even be guaranteed that the work products were produced by the person being assessed.)

Principles of assessment

All assessments should be valid, reliable, fair and flexible:

Fairness means that there should be no advantages or disadvantages for any assessed person. For example, it should not happen that one student gets prior information about the type of work performance that will be assessed, while another candidate does not get any prior information.

Validity means that a valid assessment assesses what it claims to assess. For example, if complex cooking skills are to be assessed and certificated, the assessment should involve performance criteria that are directly related to that cooking activity. An interview about the effect of the cooking processes on different foods would not meet the performance criteria.

Reliability means that the assessment is consistent and reproducible. For example, if the work performance of preparing and cooking a complex poultry dish has been assessed, another assessor (eg the future employer) should be able to see the same work performance and witness the same level of achievement.

Flexibility means that the assessor has to be flexible concerning the assessment approach. For example, if there is a power failure during the assessment, the assessor should modify the arrangements to accommodate the students' needs

Assessment strategy for (*Furniture Technician*)

This curriculum consists of 11 modules:

Module 1: Develop drawings of furniture products manually

Module 2: Prepare wooden components of the furniture

Module 3: Make Furniture Joints

Module 4: Apply surface aesthetics

Module 5: Assemble Furniture Products

Module 6: Perform finishing operations

Module 7: Perform Upholstery

Module 8: Develop Metal Furniture Products

Module 9: Handle Logistics

Module 10: Develop drawings of furniture products using CAD/CAM

Module 11: Apply surface aesthetics using CNC Machines

Sessional assessment

The sessional assessment for all modules shall be in two parts: theoretical assessment and practical assessment. The sessional marks shall contribute to the final qualification.

Theoretical assessment for all learning modules must consist of a written paper lasting at least one hour per module. This can be a combination of multiple choice and short answer questions.

For practical assessment, all procedures and methods for the modules must be assessed on a sessional basis. Guidance is provided below under Planning for assessment.

Final assessment

Final assessment shall be in two parts: theoretical assessment and practical assessment. The final assessment marks shall contribute to the final Commutative grading (qualification).

The final theoretical assessment shall consist of one 3-hour paper. The paper shall be in two parts.

Part A shall last for 2 hours and shall consist of half multiple choice and half short-answer questions. This part shall cover the major furniture technician modules:

Module 10: Develop drawings of furniture products using CAD/CAM

Module 11: Apply surface aesthetics using CNC Machines

Part B shall last for 1 hour and shall consist of short answer and at least two extended answer questions. This part shall cover the advanced modules

For the final practical assessment, each student shall be assessed over a period of two days, with two 3-hour sessions on each day. This represents a total of four sessions comprising 12 hours of practical assessment for each student. During this period, each student must be assessed on his/her ability to produce one furniture article as per drawing.

The assessment team

The number of assessors must meet the needs of the students and the training provider. For example, where two assessors are conducting the assessment, there must be a maximum of five students per assessor. In this example, a group of 20 students shall therefore require assessments to be carried out over a four-day period. For a group of only 10 students, assessments would be carried out over a two-day period only.

Planning for assessment

Sessional assessment: assessors need to plan in advance how they will conduct sessional assessments for each module. The tables on the following pages are for assessors to use to insert how many hours of theoretical and practical assessment will be conducted and what would be the scheduled dates. .

Final assessment: Training providers need to decide ways to combine modules into a cohesive two-day final assessment Programme for each group of five students. Training providers must agree the furniture articles for practical assessments in advance.

Complete list of tools and equipment

Complete list of tools and equipment

Sr#	Name of Item/ Equipment/ Tools	Specification	Quantity	Unit
1	Fire extinguishers	Standard	6	Nos.
2	First Aid box	(Including all accessories)	2	No.
3	Water & sand buckets	(3-5 litre capacity)	2	Sets
4	Portable Dust collectors	(two way)	3	Sets
5	Air blower	(Electric portable)	3	Nos
6	Exhaust units		5	Units
7	Emergency alarm	(fire, smoke)	1	Set
8	Announcement system	(with mic & 3 speakers)	1	Set
9	Cordless system	(1 hub with 5 units)	1	Set
10	Computer	(I-7, VII th generation, 500GB Hard, 8GB RAM)	26	Nos.
11	Laser Printer	(A4) (33 PPM, Duplex printing)	1	No.
12	Scanner	(A4) (600-1200 dpi resolution)	1	No.
13	Steel rule	(1 ft)	25	Nos.
14	Steel tape	(3, 5 Mtr)	25	Each.
15	Drafting table	(900 x 750 x 750 mm (H))	25	Nos.
16	Drawing board	(700 x 500 mm)	25	Nos.
17	Drafting machine	(Height & angle adjustable, sliding arm)	2	Nos.
18	Set square	(Glass with scale marking, 45 ⁰ & 60 ⁰)	25	Sets
19	T-square	(Glass, 900 mm length)	25	Nos.
20	Log band saw or Wood miser Machine	(07-15 hp)	1	No.
21	Log band saw blade sharpening machine	(Angle adjustment)	1	No.

22	Saw setting machine		1	No.
23	Butt welding machine	(High temperature setting)	1	No.
24	Grinding machine	(Both side grinding discs)	1	No.
25	Blade cutter		1	No.
26	Paper cutter		1	No.
27	Tracing pencil		25	Nos.
28	Spindle molder Machine	(With various cutters, solid profile cutters)	1	No.
29	Plunge router	(1100-1800 w, micro adjuster)	3	Nos.
30	Jig saw	(600-900 w, 60-120 mm blade length)	3	Nos.
31	Scroll saw Machine	(16" throat depth, tilt able)	2	Nos.
32	Copying saw	(6-8" in size)	25	Nos.
33	Fret saw	(6-8" in size)	25	Nos.
34	Half round file	(10")	25	Nos.
35	Half round rasp	(10")	25	Nos.
36	Triangular file	(6")	25	Nos.
37	Round file	(10")	10	Nos.
38	Compass saw	(12-18")	10	Nos.
39	Multiple rip saw Machine	(12-14" blades)	1	No.
40	Cross cut saw Machine	(12-14")	1	No.
41	Table saw Machine	(rip capacity 600-850mm, cross cut capacity 900-2000)	1	No.
42	Panel saw Machine	(12-16' x 10-12')	1	No.
43	Jointer Machine	(18")	1	No.
44	Portable planner	(6")	1	No.
45	Thickness planner Machine	(10-18")	1	No.
46	Smooth plane	(1.5-2")	25	Nos.
47	Jack plane	(1.5-2")	25	Nos.
48	Trying plane (1.5-2")	(1.5-2")	25	Nos.
49	Block plnae (1.5-2")	(1.5-2")	5	Nos.

50	Compass plane (1.5-2")	(1.5-2")	5	Nos.
51	Spoke shave plane (1.5-2")	(1.5-2")	5	Nos.
52	Rip saw (16-24")	(16-24")	25	Nos.
53	Cross cut saw (16-24")	(16-24")	25	Nos.
54	Back saw (10-12")	(10-12")	25	Nos.
55	Mitre saw	(12-16")	2	Nos.
56	Copying saw	(8")	25	Nos.
57	Work bench	(4' x 4' x 2.75')	6	Nos.
58	Veneer saw	(4-6")	25	Nos.
59	Saw vice	Standard	2	Nos.
60	Saw setting plier	(adjustable setting)	5	Nos.
61	Bevel edge chisel	(12, 20, 25, 30mm)	25	Sets
62	Mortise chisel	(2, 6, 8, 10, 12 mm)	25	Sets
63	Marking gauge	(single or two beam, 8")	25	Nos.
64	Mortise gauge	(8")	25	Nos.
65	Marking awl	(6")	25	Nos.
66	Utility knife	(standard)	25	Nos.
67	Try square	(6")	25	Nos.
68	Framing square	(2')	5	Nos.
69	Combination square	(1')	5	Nos.
70	Spirit level	(2-3')	5	Each
71	Bar clamp	(4', 5', with T bar preferably)	3	Each
72	F-clamp	(1', 2.5', 4', 5',6')	3	Each
73	Edge clamp		5	Nos.
74	Wooden clamp		5	Nos.
75	Quick action clamp	(12", 24")	5	Each
76	Carpenters mallet	1'	25	Nos.
77	Claw hammer	(350 g)	25	Nos.
78	Pincer		25	Nos.
79	Nail punch		25	Nos.
80	Mitre box		5	Nos.

81	Standard screw driver	(6", 1')	25	Each
82	Ratchet screw driver		25	Nos.
83	Philips head screw driver	(1')	25	Nos.
84	Pneumatic nailer	(10-50 mm nails capacity)	3	Nos.
85	Pneumatic screwdriver		3	Nos.
86	Double end tenoner	(3000 mm capacity)	1	No.
87	Ring attachment		1	No.
88	Wood turning lathe	(2-5' between centres)	1	No.
89	Turning chucks	(Standard, 4 jaw chuck)	3	Each
90	Turning chisels	(6 in set, different sizes)	2	Set
91	Turning gouges	(2 in set, different sizes)	2	Set
92	Inside calipers	(8", 10")	2	Each
93	Outside calipers	(8", 10")	2	Each
94	Carving chisel set	(55 in set)	3	sets
95	Carver's vice		25	Nos.
96	Hold fast clamp		5	Nos.
97	Veneer samples	(100 x 100 mm) (20-30 sample per book)	3	Books
98	Veneer splicer	(900 mm throat depth)	1	No.
99	Veneer cutting machine	(8')	1	No.
100	Glue spreader	(4' wide)	1	No.
101	Hydraulic hot press	(2-3 plates)	1	No.
102	Universal belt sander	(8')	1	No.
103	Edge sander	(3-4')	1	No.
104	Drum sander	(4')	1	No.
105	Portable belt sander	(4")	2	Nos.
106	Orbital sander	(4-6")	3	Nos.
107	Spray gun		3	Nos.
108	Nozzels		5	Nos.
109	Air compressor	(10-35 litre capacity)	2	Nos.
110	Spraying booth	Standard	1	No.

111	Powder coating plant		1	No.
112	Product hanging trolley		1	No.
113	Stitching machine		1	No.
114	Scissors		5	Nos.
115	Clamping device		5	Nos.
116	Portable grinder	(both side grinding discs)	2	Nos.
117	Hack saw	1'	3	Nos.
118	Sheet cutter		2	Nos.
119	Portable nibbler	Standard	2	Nos.
120	Rivet plier	Standard	2	Nos.
121	Drill press	(1-13 mm chuck)	1	No.
122	Portable electric drill	(1-13 mm chuck)	2	Nos.
123	Sheet bending press		1	No.
124	Arc welding plant	Portable	1	No.
125	Spot welding plant		1	No.
126	Gas welding plant		1	No.
127	Portable disc grinder	6-12"	1	No.
128	Cling foil binder		2	Nos.
129	Pneumatic stapler	(10-50 mm)	2	Nos.
130	Bar code printer		1	No.
131	Hand Pallet		3	Nos.
132	Manual fork lifter	10-15' lift, 5 ⁰ tilting	1	No.
133	CNC machining centre	(3-5 axes, ATC)	1	No.
134	CAM software	Art CAM or other	1	No.
135	CNC turning lathe		1	No.
136	Aggregates	(4 sided)	3	Units
137	Dust collection units		3	Units
138	CNC laser machine	(6 x 4' or 8 x 4' table)	1	No.
139	4-Side planner / moulder	(100-450 mm wide)	1	No.
140	Dovetail template	12"	3	No.
141	Compound mitre saw	(1')	1	No.

142	Projector	Standard	1	No.
143	Beam Saw	3600 x 2200 mm	1	No.
144	Portable thickness planner	10-12"	1	No.
145	Boring braces	150-300 mm	2	Nos.
146	Dowel Boring Machine		1	No.
147	Domino Joiner	6-12 mm	1	No.
148	Flame blower	Standard	1	No.
149	Carcass press	12 x 2' (approx)	1	No.
150	Portable circular saw	12" blade	1	No.
151	Portable planner	4-6" blade	1	No.
152	Portable sander	4-6"	1	No.
153	Biscuit Jointer	Standard	1	No.
154	Scissors	Standard	2	Nos.
155	Slot Mortiser	Variable 6-12 mm	1	No.
156	Spray booth	10' (approx)	1	No.
157	Bar clamps	4', 5'	5	Each
158	F clamp	1, 1.5, 2, 3, 5, 6'	5	Each
159	Quick action clamp	2'	5	Nos.
160	Cam clamp	1'	20	Nos.
161	C clamp	4"	10	Nos.
162	Mitre clamps	Standard	5	Nos.
163	Wire clamps	3"	10	Nos.
164	Mitre plier	Standard	2	Nos.
165	Pin hammer	100 g	5	Nos.
166	Measuring tape	3 M	25	Nos.
167	Stitching Machine	Standard	1	No.
168	Internet device	Standard	1	No.
169	Wi-fi router	Standard	1	No.
170	Strap clipper	Standard	2	Nos.
171	Strap punch	Standard	2	Nos.
172	Wrapping Machine	Standard	1	No.

173	Cutting blades	TCT, 10-14"	5	Each
174	Chain Mortiser Machine or Slot Mortiser Machine	8, 10 mm	1	No.
175	Finishing line for boards		1	Set
176	Multimedia Projector		2	Units
177	Projection Screen		2	Nos
178	Multi Boring Machine		1	No
179	Edge Banding Machine	0.3-8 mm,	1	No.
180	Planner blades	As per machine	5	Units
181	Cordless screwdriver	18 v	2	Nos
182	Pneumatic drill machine		2	Nos
183	Pneumatic screwdriver		2	Nos
184	Hose Pipe with quick coupling set		2	Sets

Sr#	Name of Consumable Supplies	Quantity
1	Gloves	
2	Apron	
3	goggles	
4	Dust mask	
5	Chemical hazard mask	
6	Safety shoes	
7	Ear plugs	
8	Brushes	
9	Phenyl powder	
10	Report templates	
11	Paper (A4)	
12	Note pad	
13	Record register	
14	Pencils (3H, 2H, & 2.5 H.B.)	
15	Basic Furniture items (blocks, shapes)	
16	Assembled furniture products (Table, chair, racks)	
17	Unassembled furniture products (Table, chair, racks)	
18	Drawing sheets	
19	Rubbers	
20	Pencil sharpners	
21	Geometry box (Protector, Shape templates, text template, compass)	
22	French curves	
23	Paper tape (1/2", 3/4")	
24	Wooden logs	
25	Log sawing blades	
26	Plywood (8x4 x 3mm)	
27	Plywood (8x4 x 6 mm)	

28	M.D.F. (8' x 4' x 3 mm)	
29	M.D.F. (8' x 4' x 7 mm)	
30	M.D.F. (8' x 4' x 16 mm)	
31	Oil stone	
32	Knock down fittings (various types)	
33	Nails (1" x 17, 1/2" x 20, 1-1/2" x 14)	
34	Screws (1/2" x 4,6, 3/4" x 8, 1", 1.5" x 8)	
35	Dowels (8 x 35mm, 10 x 45mm)	
36	Domino (25 x 35, 25 x 45)	
37	Corrugated fasteners	
38	White glue	
39	Hot melt glue sticks	
40	Glue gun	
41	Urea formaldehyde glue	
42	Contact cement (Samad)	
43	Wood planks	
44	Board pieces	
45	Profile cutters (various designs)	
46	Profile cutter (bevel angle)	
47	Straight profile	

48	v-grooving profile	
49	Solid profile (various designs)	
50	Sand paper (80, 100,140, 220,320)	
51	Veneer tape roll	
52	Thread roll	
53	Sanding belt (as per machine)	
54	Drawer railing (12", 14", 18")	
55	Handles	
56	Locks (Drawer lock, mortise lock, rim lock, century lock, pad lock)	
57	Casters	
58	Catchers	
59	Sand papers grits (80, 100, 140, 220, 320)	
60	Putty (Chalk powder, color, glue, water, plaster of paris, zinc)	
61	Stains (Various colours)	
62	Methylated spirit	
63	Oils (various)	
64	Liquid ammonia	
65	Sealer	

66	Lacquers (Various)	
67	Thinner	
68	Undercoat	
69	N. C. paints	
70	Leafing papers (various)	
71	Wax (box and sticks)	
72	Foam (1", 1.5", 2", 4", 6" in thickness)	
73	Sofa cloth (various designs)	
74	Leather	
75	Leatherite	
76	Rubber strips	
77	Shoe tacks	
78	Springs	
79	Cotton dori	
80	Jute	
81	Markeen cloth	
82	Thread	
83	Buttons	
84	Paper tape	

85	Marking chalk	
86	Needles	
87	U-pins	
88	Natural cane	
89	Synthetic cane	
90	Metal sheets	
91	Metal pipe (20 x 20, 25 x 25, 40 x 20, 40 x 12, 38 x 38 mm)	
92	Angle iron (various size)	
93	Grinding disc (various size)	
94	Boring bits (3, 4,5,6,8,10,12,20,25,30 mm)	
95	Rivets (12, 20, 30, 40, 50 mm)	
96	Grinding disc	
97	Welding rods	
98	Knock down fittings (various kinds)	
99	Brackets	
100	Corrugated sheet	
101	Bubble wrap	
102	Jumbolan	
103	Polythene wrap	

104	Cling foil	
105	Packing roll	
106	Plastics (various thickness)	
107	u-pins (12, 20)	
108	Software CD's	
109	Drawing roll	
110	CNC bits	
111	CNC cutters	
112	Wooden blocks	
113	CNC turning tools (bits, wheels)	
114	Profiles & bits	
115	Laser tube	
116	Jigs & Fixtures	
117	Health & Safety manual	
118	Spray nozzles	
119	Solid profiles	
120	Seasoning stacking model	
121	Horse rack	
122		

Credit values

The credit value of the Furniture Technician National Certificate Level 4 in Furniture Technicians defined by estimating the amount of time/ instruction hours required to complete each competency unit and competency standard. The NVQF uses a standard credit value of 1 credit = 10 hours of learning (Following Higher Education Commission (HEC) guidelines).

The credit values are as follows:

Competency Standard	Estimate of hours	Credit
A: Develop drawings of furniture products manually	140 Hours	14
B: Prepare wooden components of the furniture	60 Hours	06
C: Join components of the furniture	200 Hours	20
D: Apply surface aesthetics	100 Hours	10
E: Assemble furniture products	20 Hours	02
F: Perform finishing operations	120 Hours	12
G: Perform Upholstery	100 Hours	10

Competency Standard	Estimate of hours	Credit
H: Develop Metal Furniture Products	110 Hours	11
I: Handle Logistics	20 Hours	02
K: Develop drawing of furniture products using CAD/CAM	140 Hours	14
L: Apply surface aesthetics using CNC machines	190 Hours	19

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