

DIRECTORATE OF TECHNICAL EDUCATION, MAHARASHTRA STATE

3, MAHAPALIKA MARG, POST BOX NO. 1967, MUMBAI-400 001
PH:2264 1150, 2264 1151,30233411, FAX:22690007

E-Mail : desk11@dte.org.in/ desk11dte@gmail.com Internet: <http://www.dte.org.in>

TENDER FORM

Sr. No. TENDER NO: 11/DTE/156/2012-2013

Price Rs. 2000/-

E.M.D.3% OF THE OFFER OR Maximum Rs 5000/-

Attention is particularly invited to the **IMPORTANT INSTRUCTIONS TO BIDDERS**. (Tender form should be duly filled in, signed and stamped by authorized person, and should be accompanied [with your separate price quotation if any] with Envelope No.2 [Commercial Bid] other wise offer will be rejected.)

Please refer to Instructions for Bidders. These are available on our web site or a printed copy can be collected from Desk 11 of this office during office hours.

Tender No	: 11/DTE/156/2012-2013
Name of the Item	: CAM Lab CNC software
Last Date of Submission of Tender :	: 04/02/2013 Upto 1.00 p.m
Date of Opening of Tender	: 04/02/2013 Upto 2.00 p.m
Tender shall remain valid Till	: 120 days from the date of submission of tender
Delivery period	: 6-8 weeks from the date of issue of order.

Important Instructions To the bidders Submitting Offer Against Tender Enquiry Published By Directorate Of Technical Education, Maharashtra State, Mumbai.

Instructions for submission of Tender and its accompaniments: -

1. The documents required to submitted with tender should be STRICTLY in the order as given in Part A below, otherwise the tender may be rejected. **The documents should be serially numbered and initialed.**
2. Read the instruction in Tender Notice published in Govt. Gazette, Part – II which is published on every Thursday.
3. The offer should be submitted in the prescribed form as per TWO ENVELOPE SYSTEM ONLY.
4. Tender for each item is to be submitted separately. **Rates MUST be quoted in Indian currency (Rupee) only, as the comparison will be done on the basis of INR prices only.** No assumptions are to be made regarding concession certificates like customs duty exemption etc. All inclusive price in INR must be written on priced tender form in envelope 2. However, to pass on the benefit of concession in customs duty to educational institutes, the purchaser may, at his discretion, issue the PO in foreign currency to the lowest eligible bidder whose bid is technically valid and has been found lowest in INR prices.
5. In Commercial bid, (Envelope no 2) all the items/sub-items like taxes, duties, charges etc should be clearly mentioned. No claims will be entertained Later on from the bidders regarding this. Decision of DTE in this regard shall be final and binding on the bidders. It is in the interest of the bidders to give all the details of rates. The bid 2 envelope (commercial bid) MUST contain original tender form (purchased from this office or downloaded) with price written on it and signature of bidder in original on it. **It is compulsory to write price on tender form in Bid 2 and sign on it.** Please write the all inclusive rate and do not write “ As per

separate quotation attached” and write prices separately on attached sheets. Price must be written on signed tender form which is to be submitted in envelope 2.

6. Please note that the **TWO ENVELOPES ARE SEPARATE** (i.e. Technical and Commercial). Care should be taken while inserting respective documents.
7. ENVELOPE NO. 1 (TECHNICAL OFFER) will be opened on the date specified in Tender Notice in presence of bidder/s or their Authorized Representative.
8. The offers of the Bidders qualifying technically are only eligible for opening of envelope no.2. Commercial bid (Envelope No.2) will be opened in the presence of bidder or their authorized representative at a date which will be notified later. This bid opening date will be displayed on website as well as informed by email/SMS/telephone to the eligible bidders.
9. Pre-dispatch Inspection will be carried out by the representative of this Directorate or consignee. However inspection charges will be borne by the bidder. In case the purchaser desires, he may direct the bidders to get their items examined and certified by third party agency like reputed Central Govt labs or organizations like BIS/ERTL/SAMEER/NABL/IITs etc or State Govt agencies or institutions. This testing may be required at any stage of tender process to validate the technical specifications. The charges for testing will have to be borne by the bidder.
10. Installation and free working trial is to be given to all consignees at their sites.
11. WARRANTY SHOULD BE FOR A MINIMUM ONE YEAR OR PERIOD PRESCRIBED IN THE TENDER FORM for machines as well as for its accessories.
12. PAYMENT TERMS :- 90% payment against delivery and satisfactory installation, testing of equipment and balance 10% against training & working trail at consignee’s place and also submission of security deposit to this office.
13. The offer should be firm, inclusive of all taxes till the period of delivery. Escalation in prices will not be allowed. Reduction in Taxes / levies by Govt. during the period, the benefit should be passed on to consignees.
14. Details of specifications, relevant leaflets, highlighting technical features shall be quoted . However, purchaser may ask for any further technical clarification.
15. Make and name along with recent address of the manufacturer must be given. ISI marked equipment if available shall be quoted.
16. Free training for operation and preventive & breakdown maintenance of the equipment is to be arranged by the supplier / manufacturer immediately after delivery to minimum of 3 staff members from each of the consignee.
17. Unless specified otherwise in tender form or in any tender document supplied by this office, normally delivery is to be effected within 8 weeks from the date of final order. If the quoted delivery period is more than period prescribed it must be justified with specific reasons. Purchaser’s decision will be final in deciding the delivery period. Stores should be delivered to the consignee on working days during office hours only. Free rigorous working trial with derived results should be given at consignee’s place immediately after delivery.
18. Maintenance Manual and operation manual should be supplied along with the equipment free of cost.
19. The bidder shall submit the Tender and documents in TWO separate sealed Envelopes as follows: -

A Checklist is given along with these instructions . It should be filled in (by tick marking at appropriate place) , signed by the bidder and submitted in third bigger envelope along with Envelope 1 and Envelope 2 tender form and duly signed & stamped by the bidder.

(A) Envelope No.1: Technical Bid

The first envelope shall be clearly marked as **“Envelope NO.1” Technical Bid**. It shall contain strictly the following documents in the serial order given below:-

- 20. Covering Letter for Enclosure:** A covering letter stating the list of enclosure should be attached in the offer along with the checklist.
- 21. Payment of the Tender Form :** Copy of Cash Receipt for the purchased Tender Documents from this office or latest crossed pay order or D.D on nationalized or scheduled bank drawn in favor of Director of Technical Education, Maharashtra State, Mumbai and payable at Mumbai for value of price of Tender documents. If the bidder wishes to participate in multiple tenders , separate pay order or DD towards the cost of respective tender form should be submitted .A single DD towards the cost of multiple tender forms will not be acceptable.
- 22. Photocopy of Prescribed Tender form** purchased from this office or downloaded from web site duly signed by the bidder should be submitted in Envelope No.1 "DO NOT WRITE THE PRICE ON IT".
- 23. Earnest Money Deposit:**

Bank Guarantee or Crossed Demand Draft on Schedule Bank / Nationalized Bank drawn in favour of Director of Technical Education, Maharashtra State, Mumbai for the value of 3% of total value of stores offered subject to Max Rs. 5000/- as an Earnest Money Deposit MUST be attached . Name of the firm and tender number should be written on the back side of the Demand Draft. DD/Pay Order should be in the name of “ Director, Technical Education, MS” and payable at Mumbai and should have validity of 3 months or more.

If it is found that the E.M.D. submitted is less than 3% of total value of the stores offered (subject to max Rs 5000/) , the offer of the bidder will be rejected.

Earnest Money Deposit is Refundable .

If the bidder is a supplier registered with Central Store Purchase Organisation (CSPO of Govt. of Maharashtra) , the attested copy letter of registration with CSPO/DIC and attested copy of certificate stating that the firm is exempted from payment of Earnest Money Deposit MUST be attached .

In case of manufacturers, valid S.S.I. Certificate of registration with Directorate of Industry, Government of Maharashtra MUST be attached.

For CSPO firms and SSI manufacturers EMD exemption will be allowed only for the items mentioned in the respective registration certificates. **As such name of the item MUST be highlighted or underlined in the relevant certificate.**

EMD Exemptions for firms registered with DGS&D or NSIC will be as per rules. (Pl refer to Government Gazette Part –II which is published every Thursday at Government Press, Charni Road, Mumbai). EMD exemptions will be as per CSPO guidelines.

24. Sales Tax / VAT Registration & Clearance Certificate

Sales Tax / VAT clearance certificate [STCC or VAT CC]either from State or Central Govt. (as the case may be) showing tax paid up to **Dec2011** and no dues. Also attach VAT registration certificate or TIN allotment .

If it is not possible to submit STCC/ VAT CC along with tender, proof of application made for obtaining STCC/VAT CC to be submitted along with tender. But STCC/VAT CC **MUST** be submitted before opening of commercial bids , otherwise tender will be rejected.

Merely ST/CST/VAT registration certificates or bank challan copies etc are not sufficient and will not be accepted. **Respective clearance certificate is necessary.** (For example , in case of dealers in Maharashtra form no 415 is essential. But prescribed clearance format may vary from state to state. In any case , certificate from competent tax authorities certifying that no dues are pending against the dealer is a **MUST**.

25. **Technical Offer :-** The bidder must write clearly his/her technical offer clearly mentioning a) Name of manufacturer b) Brand name, make & model no c) Step by step specifications of the model quoted. It is necessary for the bidder to submit such document with his sign and seal on it.

26. Bill of material / Bill of quantity on the letter head of the bidder must invariably be attached.

27. Authorization Certificate:

Authorization of the manufacturer who manufactures the item mentioned in the tender document is essential if the bidder himself is not the manufacturer.

- a) Authorization letter should be in typed form on the letter head of the manufacturer duly signed by the competent authority of the manufacturing company with his name and company's seal on it.
- b) The letter head must contain the manufacturer's office address, factory address, contact numbers, email address and website address (if available) for verifying the details in the letter.
- c) Authorization letter should be in original or attested copy of original and from manufacturer directly.
- d) It should be addressed to the Director of Technical Education, Maharashtra State, Mumbai clearly authorizing the bidder to participate in this tender by **quoting tender No and name of the Model for the tendered item**
- e) Manufacturer shall assure that he/ she will supply the equipment through the bidder and will attend all service calls during warranty period.

Apart from the authorisation letter from the manufacturer, the bidder himself should produce a certificate from competent authorities stating that he is permitted to trade/ supply the items mentioned in the tender form or item of similar kind. The bidder must also produce documentary evidence that he has supplied the items of similar kind in the past to various other organizations.

If the bidder himself is a manufacture of the item mentioned in the tender for, he is required produce a certificate from competent authorities stating that he is permitted to manufacture the items mentioned in the tender form or item of similar kind. The bidder must also produce documentary evidence that he has supplied the items of similar kind in the past to various other organizations.

This office reserves the right to ask for any further documentary evidence to establish genuineness of manufacturer, bidder and authorization letter.

28. No Deviation Statement: The no- deviation certificate must mention the make & model of the item quoted by the bidder against the tender.

No Deviation statement of specification of the equipment offered giving details of specification in following pro-forma only (No other formats will be accepted):

Name of Manufacturer :-

Make & Model quoted :-

Specification of equipment stated in Tender Enquiry step by step	Specification of equipment offered by Tenderer step by step	Whether there are deviation from the tender specification Yes / No	If yes, indicate clearly which are the deviations.
1	2	3	4

Signature of Tenderer with Seal

Bidder must detail the above pro forma and mere certifying that ‘There is no deviation between tender specifications and specifications quoted by the bidder’ is not acceptable and such bids are likely to be rejected.

29. Technical Literature/Relevant Leaflet of the equipment:

Relevant leaflet /Technical literature / Maintenance manual /Catalogue highlighting products features offered in the Tender must be enclosed in original. The offer shall be considered only if the leaflets/literature is enclosed. All the technical information about the equipment required for checking whether the equipment offered as per Tender Specification or not should be available in the Technical literature enclosed. The literature should be corresponding to the Model and Make offered in the commercial Bid. In case the literature contains description of more than one model, the bidder must tick mark on name of the model and make signature there.

30. List of Users for past experience:

List of users other than this Department (other than DTE) for verifying the quality of the equipment supplied and after sales service rendered by the manufacturer . This list must contain the name of contact person and his contact details (postal address, email and contact number) and the items and year of purchase of that item by that department.

31. Performance of Bidder:

Past experience of bidder with this Department or elsewhere regarding equipment supplied to this Department – Information to be submitted in proforma giving Order No., date, name of equipment, name of consignee. Latest certificate regarding after sales service should be provided by the supplier. Minimum three recent certificates are required to be produced.

PROFORMA FOR PERFORMANCE OF Bidder

Certified that performance of the equipment supplied and after sales service provided by M/s. _____ for last 3 years is as given below :-

Sr. No.	Name of Equipment	Supply Order No.& Date	Date of Delivery	No.of failures during	No.of failures after expiry of	After sales service provided by supplier **	Remark

		for recent years	3	warranty period (Please Give details)	warranty period (Please Give details)	Unsatisfactory /Satisfactory/ Good	Please attach service reports of the supplier.
1	2	3	4	5	6	7	8

** Specific remarks only to be given in words specified.

Signature of Head of Institute/Organisation/Office

With name and seal of the Office

- 32. **Undertaking of delivery** within 8 weeks is to be submitted. In case delivery period as mentioned in the tender form is different than 8 weeks, undertaking to that effect be submitted.
- 33. **Undertaking for giving demonstration** of tendered item within short period of notice.
- 34. **Standard Mark Certificates** : If equipment is I.S.I. marked, valid copy of license issued by B.I.S. should be enclosed otherwise same is to be indicated in offer as “NOT I.S.I. Mark”
- 35. **Turn over of the bidder:** If specifically given in tender form, the bidder is required to submit the turnover of the company for last three years certified by the chartered accountant of the company.
- 36. **Declaration by the bidder (Risk purchase clause, Fall Clause, penalty clause)** : Copy of Declaration duly signed by bidder regarding acceptance of all tender conditions and also penalty clause, Risk purchase clause, fall clause. These clauses are displayed on website of this office under Tender Purchase section.

(B) Envelope No.2: (Commercial Bid)

The Second Envelope clearly marked, as “Envelope No.2” Commercial Bid shall contain the following: -

- 37. Main Priced Tender form (Total Price to be quoted on this Tender form with signature & Seal of bidder.) Bidders should give separate quotation on their letter head as per the price structure given in point 2 below. This form is in addition to one copy to be submitted in Envelope 1. But the copy in envelope 1 should have only signature & seal on it and NO Price should be written on it.
- 38. The rate should be quoted only for the items specified in the list of requirement and should be for items of given specification / Mark /Model/ Manufacture and be as follows: -
 - a. Free delivery at destination basis including cost of Training to the minimum 3 staff of consignee for operation and maintenance of equipment.
 - b. Break up of price giving basic price and price of standard Accessories.
 - c. Percentage of Excise Duty if applicable
 - d. Sales Tax / C.S.T. / VAT
 - e. Installation Charges, if any

- f. The charges for Installation, plumbing, foundation, electrification as recommended by manufacturer etc. if any should be mentioned separately by the bidder.
- g. Normally the inspection will be at the consignee’s place. If the inspection is at the factory or at the site then the TA/DA of the inspectors will have to be borne by the supplier.
- h. Inspection charges if any are to be borne by the supplier. The supplier shall arrange all the materials/facilities required for the inspection.

PRICE STRUCTURE

Tender No. _____

Name of Item :

Model No. :

i)	Basic Price	Rs.
ii)	Excise Duty (if any) (Mention percentage of Excise Duty)	Rs.
iii)	Sales Tax / VAT (Specify rate at which S.T. / VAT Claimed)	Rs.
iv)	Packing & Forwarding Charges (Including loading and unloading)	Rs.
v)	Freight Charges	Rs.
vi)	Insurance Charges	Rs.
vii)	Installation / Trial Commissioning charges	Rs.
viii)	Other if any (Please specify)	Rs.

Total Price (i to viii) Rs.
 F.O.R. Destination
 (Rupees in words-----)

NOTE :- Rate should be quoted only for the models mentioned in Technical Bid.

(C) Submission of Tender: -

- The two sealed Envelopes No.1 & 2 shall be put again together in one common cover and sealed. The sealed cover shall be marked on the left hand top corner.

“ Tender for _____Tender No._____

Date of Closing _____Date of Opening _____ “

- The full name and address of the bidder and the name of the authorised agent delivering the sealed cover containing tender shall be written on the bottom left hand corner.
- The bidder should ensure that their tender is received by Directorate of Technical Education, Maharashtra State, Mumbai before the last date & time of the closing the tender.
- The tender received after closing date and time will not be accepted at all. All the bidders should put their tender in the “Tender Box” kept in Desk No.11 of Directorate of Technical Education.

(D) Opening of Tender and evaluation criteria -

- The tenders will be opened on the date specified in the tender notice. The supplier/their authorized representative can attend the tender opening.
- The offers will be first evaluated for completeness wrt documents to be submitted with the offer. Those offers which have all the supporting documents as per requirements in the tender enquiry will be evaluated on technical grounds. Commercial bids of technically valid offers will be opened and lowest offer will be recommended for award of contract. Award of contract will be as per prescribed Govt procedure .
- Bidder quoting the lowest offer will be informed about the intention of award of contract (Acceptance of Tender) by sending an Acceptance Letter(A/L). On acceptance of Terms and conditions of A/L and submission of security deposit, Acceptance of Tender will be released. Security deposit will be 3% of the value of goods ordered and will be retained by the purchaser till 12 months from the date of installation or 15 months from the date of award. In the latter case, it is expected that delivery of goods and installation will be complete in 3 months. In case there is delay in supply and purchaser has extended the delivery period, the retention period of security deposit will have to be extended accordingly. SD will be released after expiry of warranty period subject to clearance from the consignee institute.
- Sample A/L and A/T are available on website of this office under Tender Purchase section .
- The date of Commercial Opening will be same as date of opening of tenders or as specified on the website of this office or will be informed to the bidders whose bids have been found to be technically valid .

Sr. No.	Description of Goods	No. of QTY (likely to vary) ± 25%	Price per Unit	Indian or Foreign If Indian State Where Manufactured.
01	CAM Lab CNC software 10 user set Detailed technical specifications as per Annexure I of this document.	04 No		
	Consignee :- The Principal, Government Polytechnic, Arvi, Pune, Ahmednagar and Govt College of Engg &Research, Awasari .Dist Pune	QUANTITY - 04 No		

Check List of documents to be submitted along with tenders (This check list should also be submitted in Envelope 1)

Sr No	Item	Bidder should tick at appropriate place	Page no of technical bid (envelope 1)	Remark (to be filled in by DTE official)
1	Covering Letter for tender			
2	IPO/DD/ Copy of cash receipt			
3	Copy of tender form signed and stamped <i>without price</i>			
4	DD /BG for EMD			
5	EMD Exemption certificate			
6	Sales tax /VAT registration certificate			
7	ST/ VAT Clearance Certificate (Dec 2011)			
8	Authorization certificate from manufacturer.			
9	No deviation certificate in prescribed pro-forma only.			
10	Technical literature/leaflet			
11	List of users or performance certificate in given format			
12	Undertaking of delivery I within prescribed period			
13	ISI mark certificate			
14	Undertaking for demo			
15	Undertaking about risk purchase, fall clause, penalty clause			
16	All above documents are enclosed in one envelope and marked it as Envelope1 ‘ Technical’			

Documents for Envelope 2				
17	Main priced tender form or downloaded tender form with price on it . Stamped and signed.			
18	Quotation on letter head in the Price Structure given in “Instructions to Bidders”			
19	All above documents are enclosed in one envelope and marked it as Envelope2 ‘ Commercial’			
20	Tender no ,item name last date , date of opening, name & address of bidder written on Both envelopes 1 & 2 .			
21	Envelope1 (containing Check list) and Envelope 2 put in Bigger third envelope.			

Signature & Seal of Bidder

Date

For office use only (Bidders should not write anything below this line)

After Verification by DTE official .

Remarks :-

Signature of DTE representative

Date

Annexure I

Detailed technical specifications:-

1) NCYCLOPEDIA - Multimedia CNC Teachware

1.1 The software should enable teaching of CNC milling and turning technology in a highly effective manner through multimedia - videos, animations, sound, pictures and text.

1.2 It should cover all relevant topics listed below

a) CNC Machine construction: Bed, guideways, ballscrews, LM guides, spindle, chuck, steady rest, tailstock, rotary table, auto pallet changer, tool changers and turrets. Each topic must be explained by a text explanation, animations, and videos of internals of CNC machines.

b) CNC milling operations : Face milling, pocket milling, side milling, chamfer milling, spot facing, helical boring, side slot milling, thread milling, cylindrical interpolation, T slot milling, groove milling, center drilling, drilling, peck drilling, deep drilling, combination hole drilling, countersinking, counterboring, back spotfacing, rough boring, finish boring, tapping. Each operation must be explained by a text explanation, graphic of the tool path, animation, and video.

c) CNC turning operations: rough turning, rough facing, finish turning, finish facing, threading, radial grooving, face grooving, parting off, drilling, peck drilling, reaming, tapping. Each operation must be explained by a text explanation, graphic of the tool path, animation, and video.

d) Cutting tools used in CNC machines : turning tools, grooving tools, threading tools, drill, tap, reamer, face mill, end mill, bore, finish bore, thread mill, T slot mill, Countersink, chamfer mill, side and face mill, etc. Indexable insert geometries, cutting edge geometry, ISO nomenclature for inserts.

e) Tool holders used in turning – turning, grooving, threading, etc. Tool holders used in milling – side lock, face mill, collet, morse taper, heat shrink, floating tap holder. Each topic must be explained by a text explanation, animations, and videos. ISO nomenclature for turning and boring holders.

f) Cutting parameters in turning and milling – constant surface speed, limiting spindle speed, tool wear, types of tool wear, tool life, effect of nose radius and feed rate on surface finish in turning.

g) Work holding used in CNC machines: tailstock, steady rest, chuck, hard and soft jaws, soft jaw boring.

h) CNC Programming concepts and G and M codes, ISO programming formats, canned cycles, subprograms etc. Each programming command must be explained with a text explanation, graphic of the tool path, animation, and video.

1.3 Software must use video clips from actual machines, tools and machining situations in industry, to enable the student to understand how CNC machines are used in industry and establish the link between theory and practice.

2) SEENCTURN and SEENCMILL - Manual program simulator software

2.1 Software should have the facility for the student to type manually written CNC programs.

2.2 Software should debug the manually written part programs for program syntax errors.

2.3 Should display the nature of errors and their locations so that the student can correct

- 2.4 Student should be able to assign tools to tool numbers in the program from a tools library.
- 2.5 Tools library must have commonly used tools with graphical tool shape display.
- 2.6 Software should have facility to graphically simulate common turning and milling operations.
- 2.7 Tool shape and positioning must be displayed in simulation.
- 2.8 Software should indicate logical errors in the tool path simulation.
- 2.9 It should be able to interpret and simulate ISO RS274 programming format - cycles and subprogram commands.
- 2.10 Should be capable of simulating turning codes and canned cycles: G90, G92, G94, G71, G72, G73, G74, G75, and M98.
- 2.11 Should be capable of simulating milling codes and canned cycles: G81, G82, G83, G84, G85, G76, G87, and M98.
- 2.12 Graphical tool path simulation must show the raw material, finished part, tool shape.
- 2.13 Simulation must be possible till next block, next operation, next tool, and till the program end.
- 2.14 Tool motion, tool position, spindle speed and direction, feed rate must be shown during simulation.
- 2.15 The software should have an online help for programming codes.
- 2.16 Vendor must provide student's hand book having ready-made exercises with dimensioned drawings, process plan and questions for students.
- 2.17 Vendor must provide teacher's hand book having ready-made exercises with dimensioned drawings, process plan, questions and answers for teachers.
- 2.18 Vendor must provide CNC programming guides CNC for turning and milling in hard and soft copy. Guides must have text explanations, graphic of the tool paths, dimensioned drawings and example programs for each CNC command.

3) CAPSTURN and CAPSMILL - CAM programming software

- 3.1 Free copies of the software for 120 days limited license to every student to enable him load the software on his personal computer for completing assignments at home.**
- 3.2 The software must have an in-built CAD to define part and blank shapes, as well as be able to import data from external CAD software.
- 3.3 Inbuilt CAD must allow quick definition of turning areas like grooves, undercuts and shafts, and milling areas like hole patterns, milling areas and slots.
- 3.4 The student must be able to select the workpiece material from lists of national standards

like DIN, JIS, BIS, etc.

3.5 The software must determine the cutting speed, feed rate and depth of cut automatically using the workpiece material, tool material and tool type, from a cutting parameters library.

3.6 The software must come with fully populated data in the cutting parameters library, so that the student can start using it without any configuration. The student must be able to configure the cutting parameters at any later date.

3.7 Must support common milling operations : Face milling, pocket milling, side milling, chamfer milling, slot milling, side slot milling, T slot milling, spot facing, helical boring, thread milling, cylindrical interpolation, text engraving, center drilling, drilling, peck drilling, deep drilling, boring, combination hole drilling, countersinking, counterboring, back spotfacing, tapping, reaming, finish boring.

3.8 Must support common turning operations : Plain turning, plain facing, contour turning, contour facing, contour turning with cuts along contour, contour facing with cuts along contour, finish turning, finish facing, threading, radial grooving, face grooving, parting off, center drilling, drilling, peck drilling, reaming, countersinking, counterboring, tapping.

3.9 The software must support tool selection from a database with all common cutting tools for milling: Face mill, side and face mill, end mill, T-slot mill, thread mill, chamfer mill, dovetail mill, form tools, center drill, drill, reamer, tap, hole mill, trepanning cutter, bore, countersink, back spotface, combination tool.

3.10 The software must support tool selection from a database with all common cutting tools for turning : Turning, boring, back boring, external grooving, internal grooving, face grooving, external threading, internal threading, form tools, center drill, drill, reamer, tap, hole mill, trepanning cutter, end mill, countersink.

3.11 The software must support quick definition of ISO holders for turning and boring.

3.12 Should be must be able to simulate the tool path graphically, with actual shape of the insert and holder in turning, and the tool in milling. Both filled-in graphics and line mode tool path must be available, for quick checking. Must support simulation till the next motion, next tool, next operation, or till the end.

3.13 The software must automatically generate CNC programs with subprograms and canned cycles to reduce program length.

3.14 The software must generate CNC programs with full documentation for ease of understanding, with data like date of generation, part name and number, tool names and operation names appearing as comments in brackets.

3.15 Should be able to generate documents commonly used on the shop floor: cycle time sheet with process and cycle time details, operation-wise tools list, User must be able to print the documents, and export tabular data as PDF files or Excel files, for further analysis.

3.16 Should be able to calculate and display the spindle power required for each operation, to educate the student on optimal use and safety aspects of machine spindle power. The operation-wise spindle power must be displayed as a chart or graph with the selected machine's half hour and continuous ratings superimposed.

3.17 Should calculate the cycle time accurately taking into account the selected machine's parameters like rapid traverse rate, axes acceleration time, axes deceleration time, spindle acceleration time, spindle deceleration time, tool change time, and time for miscellaneous functions like chuck oarvi/close, tailstock in/out, door oarvi/close, table rotation and pallet change.

3.18 Software must select spindle direction automatically from the hand of tool, turret position (front or rear) and orientation (tool face up or down).

3.19 Must be able to generate a tool path sheet for each operation showing the tools and tool paths for each operation. Teacher must be able to print this and file it as a record of the student's work.

3.20 To minimize training time, the software must have graphical user interfaces to program all machining operations. The student must be able to understand the parameters to be entered from this, without having to refer to user manuals or online help.

3.21 To minimize training time, the software must have ready-to-use tutorials that enable the teacher or student to self-learn the software. This is to enable faculty rotation and fast training of fresh faculty.

4) DONC - CNC machine simulator software

4.1 CNC machine simulator software must facilitate in enhancing competency in operating CNC machines. Like a flight simulator.

4.2 It should enable a student to learn machine operation without an actual machine. Students must be able to safely and efficiently practice their machine operating skills on a PC, and get ready to operate real CNC machines in a very short time.

4.3 Software should simulate popular makes and models of machines and CNC control systems realistically - all machining operations, CNC console operation like MDI, Jog, tool offset setting, single block check, etc. Door open/close, spindle on/off, collisions, etc. must be simulated visually and with audio effects.

4.4 Should support 2 and 3 axis CNC machines: lathes and milling machines

4.5 Should simulate Fanuc, Sinumerik (Siemens) , Mitsubishi CNC systems and control panels

4.6 Control panels must be simulated exactly, with same keyboard layout and logic as actual

4.7 Machine must be simulated in 3D graphics

4.8 Real-time dynamic rotation, zooming and panning of machine views must be possible

4.9 Must simulate G-codes and M-codes, canned cycles, subprograms, macros

4.10 Must simulate post-processed G and M codes program files from a CAM software

4.11 Must simulate work piece mounting and tool offsets setting

4.12 Tools database must be customizable by user

4.13 Turret must be able to be configured for 4, 8, 12 tools must be customizable by user

4.14 ATC must be able to be configured for horizontal / vertical orientation by user

4.15 On-screen measurement for tool offsets setting must be possible

4.16 On-screen measurement of machined dimensions with callipers / gauges must be possible

4.17 Roughness measurements based on cutting parameters must be possible

4.18 Simulation must be with audio effects for coolant, machining operations and chips generation

4.19 Operation process recording and replay in AVI format for investigation must be possible

4.20 Must support touch screen monitors for realistic learning

5) TEACHER - STUDENT NETWORK MODULE

5.1 Network Monitoring facility for training

When the software is installed on a local network it must provide the instructor with the capability of managing and monitoring students, classes and tests. Instructor should be able to query students and control machine login, logoff and machine operations. The system should show students screen information on instructor's PC, and enable instructor to remotely assist students via remote view or to take control of a student's PC

5.2 Student management facility

Student should be able to register with a unique user name and password. Once the student logs in from any computer in a local network the instructor should have a provision to centrally manage, monitor and tutor the student.

5.3 Student exercises management facility

Teacher must be able to add tailor-made exercises into the server and transmit exercises including pictures to student PC. Teacher must be able to view answers from the student PC instantaneously.

5.4 Test paper management facility

Software must have test questions library management facility for test paper management, test process management with automatic marking of test papers. Test administrative tools like management of test data, test permits and test results to greatly simplify testing must be available.

6) GENERAL SPECIFICATIONS

The software should preferably PC based LAN type server version

1.5 Gb RAM , 600 MB HDD space , 1024x768 VGA with OarviGL

Compatible to Windows XP/7 operating system with USB port lock with multi-user network licenses

The software should provide full technical support for Installation, configuration and setting

Training for operation and troubleshooting along with printed copies and Soft copy of programming manuals.