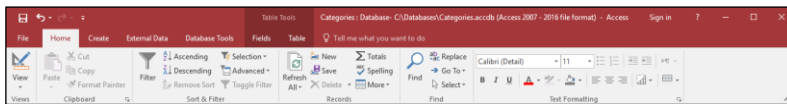# ICDL

Using Databases
This quick reference is for Microsoft Access 2016 on Windows 10.
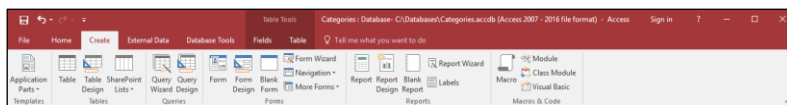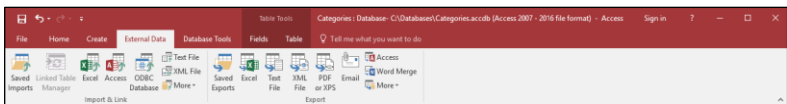
Quick Reference

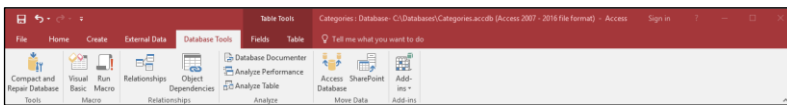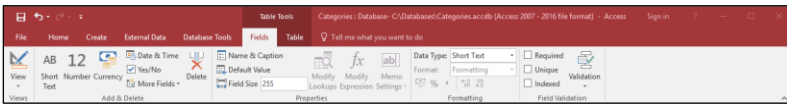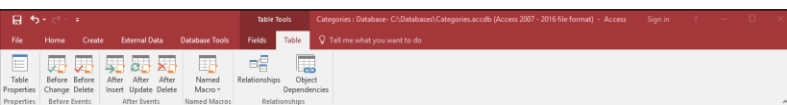**Access 2016 Tabs**

Home

Create

External Data

Database Tools

Fields

Table

Certification Test Goals

This module sets out essential concepts and skills relating to understanding the concept of a database and demonstrating competence in using a database application.

Successful candidates will be able to:
- Understand what a database is and how it is organised.
- Create a simple database and view the database content in various modes.
- Create a table, define and modify fields, and create relationships between tables. Enter and edit data in a table.
- Use filters and queries to retrieve specific information from a database.
- Create a form to enter, modify and delete records and data in records.
- Create routine reports and prepare outputs ready for print or electronic distribution.

Keyboard Shortcuts

Purpose	Keyboard Shortcut
Open a database	Ctrl+O
Save a database	Ctrl+S
Print a database	Ctrl+P
Close a database	Ctrl+W
Undo	Ctrl+Z
Redo or Repeat	Ctrl+Y
Help	F1
Switch between apps	Alt+Tab
Next field	Tab
Previous field	Shift+Tab
Up one screen	Page Up
Down one screen	Page Down
First record	Ctrl+Home
Last record	Ctrl+End
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Properties	Alt+Tab
Open object in design view	Ctrl+Enter
Save object	Ctrl+S

1   Understanding Databases

1.1   Key Concepts

1.1.1   Understand what a database is.
- A collection of related data organised for fast search and retrieval.

1.1.2   Understand that information is the processed output of data.
- Information is data that has been organised, structured and contextualised to give it meaning and purpose.

1.1.3   Understand how a database is organised in terms of tables, records and fields.
- Tables – Data arranged in rows and columns.
- Records – A complete set of information in a table.
- Fields – The smallest units of information that can be accessed.

1.1.4   Understand that all database data is stored in tables. Understand that changes are automatically saved.
- All data entered into Access is stored in tables. Any changes made to this data is automatically saved by the program.

1.1.5   Know some of the common uses of databases like:
- Social networks.
- Booking systems.
- Government records.
- Bank account records.
- Hospital patient details.

1.2   Database Organisation

1.2.1   Understand that each table in a database should contain data related to a single subject type.
- When tables contain data related to a single subject type, it is easier to search for and locate data.

1.2.2   Understand that each record in a database should contain data related to a single subject.
- A collection of related data organised for fast search and retrieval.

1.2.3   Understand that each field in a table should contain only one element of data.
- For example, first name in one field, surname in second field.

1.2.4   Understand that field content is associated with an appropriate data type like: short text, number, date/time, yes/no.
- Data Type – The characteristic of a field that determines what type of data it can hold.

- The following are examples of different data types:

Short Text	Text, numbers, or both up to 255 characters.
Long Text	Text, numbers, or both up to 65, 536 characters.
Number	Numbers used in calculations.
Large Number	Used to efficiently calculate large numbers.
Date/Time	Date, times, or both up to 8 bytes.
Currency	Currency values prevents rounding.
AutoNumber	Unique sequential numbers automatically added to field.
Yes/No	True/False On/Off.
OLE Object	Documents created in other Office programs up to 1GB.
Hyperlink	Hyperlink to a UNC path or URL up to 2048 characters.
Attachment	Stores one or more file attachments in one field.
Calculated	Data created using a formula, calculated value can later be retrieved to use again.
Lookup Wizard	Create a field that allows the choice of a value from another table or list.

1.2.5 Understand that fields have associated field properties like: field size, format, default value.
- Field Properties – A set of characteristics that control how the field is stored, entered, or displayed.

1.2.6 Understand what a primary key is.
- It uniquely identifies each record in a table to avoid data duplication and to allow faster data access.
- Examples include Order ID, Product ID, Customer ID or Autonumber.

1.2.7 Understand that the main purpose of an index is to speed up search queries.
- It helps find and sort records faster.

1.3 Relationships

1.3.1 Understand that the main purpose of relating tables in a database is to minimise duplication of data.
- Minimising duplication of data helps to ensure the integrity of the data.

1.3.2 Understand that a relationship is built by matching a unique field in one table with a field in another table.
- It is not possible to match duplicate field names; each field has its own unique identifier.

1.3.3 Understand the importance of maintaining the integrity of relationships between tables.
- Integrity ensures that relationships are valid. Integrity avoids records being accidentally deleted or altered.

2 Using the Application

2.1 Working with Databases

2.1.1 Open a database application.
- Click the Start button.
- Scroll to Access 2016.
- Click Access 2016.

2.1.1 Close a database application.
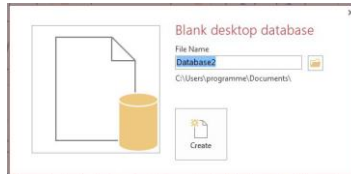- Click the 'x' icon on the top right of the window.

2.1.2 Open a database.
- On the File tab, click Open.
- Click Browse.
- Navigate to the database to open and click Open.

2.1.2 Close a database.
- On the File tab, click Close Database.

2.1.3 Create a new database and save to a location on a drive.

- On the File tab, click New.
- Click Blank database.
- Enter a file name in the File Name box.
- Beside the File Name box, click the Folder button.
- Navigate to the location required.
- Click OK.
- Click Create.

2.1.4 Restore, minimise the ribbon.
- Double-click any tab to minimise the ribbon.
- Double-click any tab again to restore the ribbon.

2.1.5 Use available help resources.
- Click on the File tab.
- Click on the Help button on the top right of the window.

2.2 Common Tasks

2.2.1 Open a table, query, form, report.
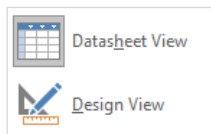- Select the table, query, form or report in the Navigation Pane.
- Double-click the object.

2.2.1 Save a table, query, form, report.
- Ensure the table, query, form or report is open.
- Click the Save button on the Quick Access Toolbar.

2.2.1 Close a table, query, form, report.
- Click the close 'x' icon on the top-right of the object window.

2.2.2 Switch between view modes in a table, query, form, report.

- On the Home tab, in the Views group, click the View arrow and click the preferred view.

2.2.3 Delete a table, query, form, report.
- Select the table, query, form, or report in the Navigation Pane.
- On the Home tab, in the Records group, press the Delete button.
- Click Yes to confirm deletion.

2.2.4 Navigate between records in a table, query, form.

Record: I◄ ◄ 1 of 14 ► ►I ►* No Filter Search

- Use the Navigation bar in the lower left corner of the window to go forward or backwards through the records.

2.2.4 Navigate between pages in a report.
- Click File and then click Print.
- Click Print Preview.
- Beside the Page: box in the report, click the Next Page or Previous Page button.

2.2.5 Sort records in a table, form, query output in ascending, descending numeric, alphabetic order.
- Click a field in the table, form, query to sort.
- On the Home tab, in the Sort & Filter group, click the Ascending or Descending buttons.

3 Tables

3.1 Records

3.1.1 Add records in a table.
- In Datasheet View, on the Home tab, in the Records group, click the New button.
- Enter data in fields required.

3.1.1 Delete records in a table.
- Select the record to delete.
- On the Home tab, in the Records group, click the Delete button.
- Click Yes to confirm deletion.

3.1.2 Add, modify data in a record.
- In Datasheet View, click the record to add or modify the data.

3.1.2 Delete data in a record.
- In Datasheet View, select the data to delete and press the Delete key.

3.2 Design

3.2.1 Create and name a table.
- On the Create tab, in the Tables group, click the Table button.
- On the Fields tab, in the Views group, click the View button.
- Click Design View.
- When prompted, enter a name for the table and click OK.

3.2.1 Specify fields with their data types like: short text, number, date/time, yes/no.
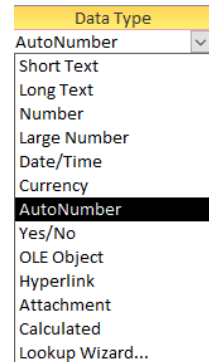
- In Design View, click the Data Type column for the field.
- Click the drop-down arrow and select a Data Type.

3.2.2 Apply field property settings: field size, default value.
- In Design View, click a field row.
- On the General tab at the bottom of the window, click the Field Size or Default Value box.
- Enter or modify values as required.

3.2.2 Apply field property settings: number format, date/time format.

- In Design View, click a field.
- On the General tab at the bottom of the window, click the Format box.
- Click the drop-down arrow and select a Format.

3.2.3 Understand consequences of changing data types, field properties in a table.
- Data already entered into a table may be lost when a field attribute such as field size is changed or a data type such as short text is changed to number,

3.2.4 Create a simple validation rule for numbers.
- In Design View, click a field.
- On the General tab at the bottom of the window, click the Validation Rule field.
- Enter the validation rule required.

3.2.5 Set a field as a primary key.
- In Design View, click the field to select as the primary key.
- On the Design tab, in the Tools group, click the Primary Key button.

3.2.6 Index a field with, without duplicates allowed.
- In Design View, click the field row.
- On the General tab at the bottom of the window, click the field property Indexed.
- Click the drop-down list and click Yes (No Duplicates) or click Yes (Duplicates OK).

3.2.7 Add a field to an existing table.
- In Design View, click an empty field row.
- Enter a new field name.
- Click a Data Type from the drop-down list.

3.2.8 Adjust the width of column(s) in a table.
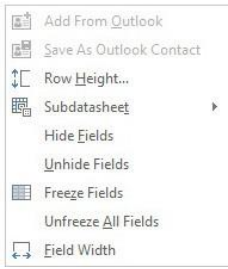
- In Datasheet View, select the column heading.
- On the Home tab, in the Records group, click the More button.
- Click Field Width.
- Enter a width in the Column Width box.
- Click OK.

3.3 Relationships

3.3.1 Create a one-to-many relationship between tables.

- On the Database Tools tab, in the Relationships group, click Relationships.
- On the Design tab, in the Relationships group, click Show Table.
- Select one or more tables, click Add. Click Close.
- Drag a field from one table to the common field in the other table.
- In the Edit Relationships dialog box, confirm that field names shown are the common fields for the relationship.
- The field on the one side of the relationship must have a unique index. The Indexed property must be set to Yes (No Duplicates), for example a primary key.
- The field on the many side should not have a unique index. The Indexed property must be set to either No or Yes (Duplicates OK).
- Click Create.
- When finished in the Relationships window, click Save to save the relationship layout changes.

3.3.2 Delete a one-to-many relationship between tables.

- On the Database Tools tab, in the Relationships group, click Relationships.
- On the Design tab, in the Relationships group, click All Relationships.
- Click the relationship line for the relationship you wish to delete.
- Press the Delete key.
- Click Yes.
- Click Save to save changes.

3.3.3 Apply referential integrity between tables.

- In the Relationships window, click the relationship line for the relationship to change.
- Double-click the relationship line you wish to change.
- In the Edit Relationships box, select the Enforce Referential Integrity check box.
- Make any additional changes to the relationship, click OK.

4 Retrieving Information

### 4.1 Main Operations

4.1.1 Use the search command for a specific word, number, date in a field.
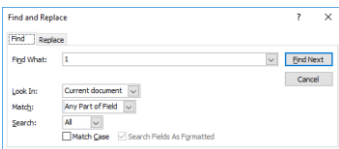
- On the Home tab, in the Find group, click the Find button.
- Enter the word, number or date to find the Find What: box.
- Ensure Current document is selected in the Look In box and Any Part of Field is selected in the Match box.
- Click Find Next until the value is found.

4.1.2 Apply a filter to a table, form.
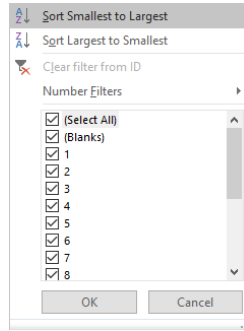
- Open the table or form.
- On the Home tab, in the Sort & Filter group, click the Filter button.
- Check the boxes to deselect the rows to filter.
- Click OK.

4.1.3 Remove filter from a table, form.

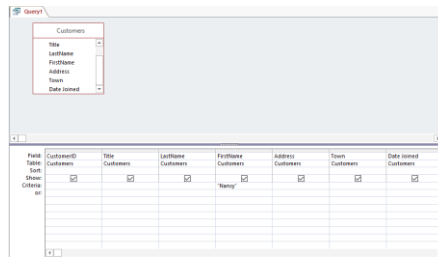- On the Home tab, in the Sort & Filter group, click the Advanced button.
- Click Clear All Filters.

4.2 Queries

**4.2.1 Understand that a query is used to extract and analyse data.**

- Queries allow users to locate data according to specific search criteria.

**4.2.2 Create a named single-table query using specific search criteria.**

- On the Create tab, in the Queries group, click the Query Design button.
- Select the table to add from the Show Table window.
- Click Add and then click Close.
- Click and drag the fields required into the Field row in the window below.
- Click the Criteria box of the field to query.
- Enter the query criteria.
- Close the query and then click Yes to confirm and save.
- Enter the name required in the Query Name box.
- Click OK.

4.2.3 Create a named two-table query using specific search criteria.
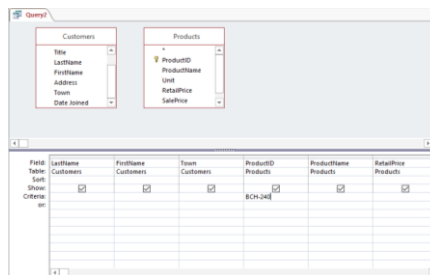
- On the Create tab, in the Queries group, click the Query Design button.
- Select the tables to add from the Show Table window.
- Click Add and then click Close.
- Click and drag the fields required into the Field row in the window below.
- Click the Criteria box of the field to query.
- Enter the query criteria.
- Close the query and click Yes to confirm save.
- Enter the name required in the Query Name box.
- Click OK.

4.2.4 Add criteria to a query using one or more operators: = (Equal), <> (Not equal to), < (Less than), <= (Less than or equal to), > (Greater than), >= (Greater than or equal to).
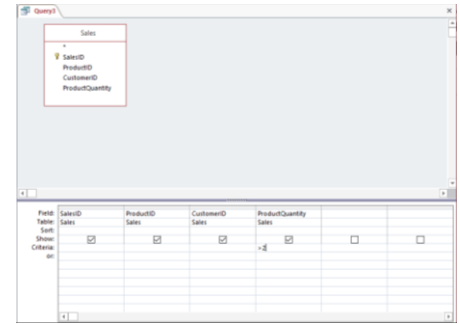
- In Design View, click into the Criteria box of the field to be queried.
- Enter the criteria using a logical operator.

4.2.5 Add criteria to a query to sort records in ascending, descending numeric, alphabetic order.

- In Design View, identify the fields to specify the criteria for.
- On the Home tab, in the Sort & Filter group, sort the criteria by selecting the Ascending or Descending command.

4.2.6 Add criteria to a query using one or more logical operators: AND, OR, NOT.

- In Design View, click into the Criteria box of the field to be queried.
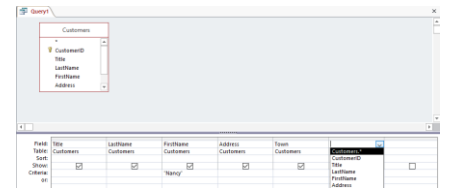- Enter the criteria using a logical operator.

4.2.7 Use a wildcard in a query, * or %,? Or _.

- In Design View, click into the Criteria box of the field to be queried.
- Enter the criteria using a wildcard.
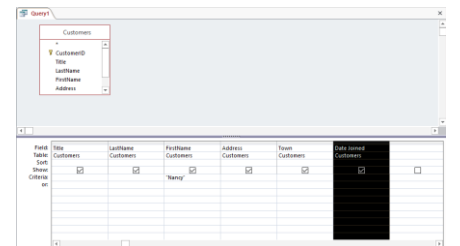
4.2.8 Edit a query: modify, remove criteria.

- In Design View, click into the Criteria box of the field to be queried.
- Modify, or remove criteria as required.

4.2.9 Edit a query: add fields.

- In Design View, click the field box of a blank column.
- Click the drop-down arrow that appears.
- Click the field to add to the query.

4.2.9 Edit a query: remove fields.

- In Design View, select the column heading of the field to delete.
- Press the Delete key.

4.2.9 Edit a query: move fields.

- In Design View, select the column heading of the field to move.
- Drag and drop the field's column heading to the required location.

4.2.9 Edit a query: hide, unhide fields.

- To hide a field, in the query, select by right-clicking the field to be hidden. Click Hide Fields.
- To unhide a field, right-click any of the fields and click Unhide Fields.
- In the Unhide Columns dialog box, select the checkbox of the field to be unhidden and click Close.

4.2.10 Run a query.
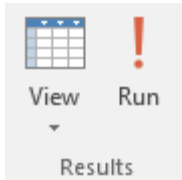
- On the Design tab, in the Results group, click the Run button.

5 Forms

5.1 Using Forms

5.1.1 Understand that a form is used to display, add and edit records.
- Forms allow users to view and navigate through records and add, delete, or modify records as needed.

5.1.2 Create and name a simple form.
- Select a table or query.
- On the Create tab, in the Forms group, click the Form button.
- Close the form and when prompted, click Yes to save.
- Enter the name required in the Form Name: box.
- Click OK.

5.1.3 Use a form to insert new records.
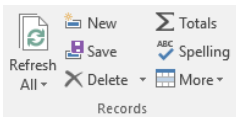
- Ensure the form is open.
- On the Home tab, in the Records group, click the New button.
- Enter data in the fields of the new record as required.

5.1.4 Use a form to delete records.
- Ensure the form is open.
- Select the record to delete.
- On the Home tab, in the Records group, click the Delete arrow.
- Click Delete Record.
- Click Yes to confirm deletion.

5.1.5 Use a form to add, modify, delete data in a record.
- Enter the number of the required record in the Navigation bar at the bottom of the form window.
- Press the Return key.
- Click the field to alter and add, modify or delete data as required.

5.1.6 Add text in headers, footers in a form.

- In Design View, on the Design tab, in the Controls group, click the Label button.
- Go to the header or footer and click and drag to create a text box.
- Add the text required.

5.1.6 Modify text in headers, footers in a form.
- In Design View, click the text in the header or footer.
- Modify the text as required.

6 Outputs

6.1 Reports, Data, Export

6.1.1 Understand that a report is used to present selected information from a table, query.
- Reports allow users to create a printed copy of all or selected data from a table or query for greater ease of reference and understanding.

6.1.2 Create and name a simple report based on a table, query.
- Select a table or query.
- On the Create tab, in the Reports group, click the Report button.
- Close the report and, when prompted, click Yes to save and then confirm the name of report and click OK.

6.1.3 Create and name a grouped report.
- On the Create tab, in the Reports group, click Report Wizard.
- Select the fields to include on the report by using the arrows located between the Available Fields:

and Selected Fields: windows. Click Next > when finished.
- Add the grouping levels by double-clicking a field name in the list, or with the arrow buttons.
- Click Grouping Options…
- Set the Grouping intervals: as desired and click OK.
- Click Next > when finished.
- Select how data will be sorted. Click Next >
- Select how the data will be viewed. Click Next > when finished.
- To name a report, on the final step of the Report Wizard edit the title of the report in the What title do you want for your report? box.

6.1.3 Sort records in a grouped report.
- In the Report Wizard, click the first drop-down list and choose a field on which to sort. Choose Ascending or Descending as required.

6.1.3 Calculate summary information like: sum, minimum, maximum, average
- Click Summary Options… in the Report Wizard window.
- Select the Sum, Avg, Min, Max checkbox as required to include the calculations in the group footer.
- Click OK.
- Follow the steps until the final window of the Report Wizard.

6.1.4 Edit a report: change arrangement of data fields, headings.
- In Design View, click a data field or heading and drag to the required location.
- In some cases, the data fields may need to cut to be later pasted back, or other data fields may need to be resized to make room for this move.

6.1.5 Edit a report: add, modify text in headers, footers.
- In Design View, click the text box in the header or footer.
- Modify the text as required.

**6.1.6 Export a table, query output in spreadsheet, text file, csv, XML format to a location on a drive.**
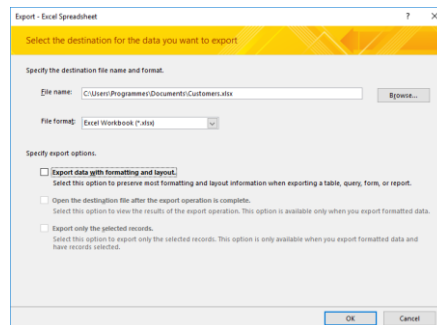
- Select the object in the Navigation Pane.
- On the External Data tab, in the Export group, click the relevant Application button.
- Select a location.
- Check the Export data with formatting and layout checkbox.
- Click OK.

6.1.7 Export a report output in pdf format to a location on a drive.
- Click the report to be exported.
- On the External Data tab, in the Export group, click PDF or XPS.
- Navigate to the drive to save the report to.
- Ensure PDF is selected in the Save as type: drop-down menu, and click Publish.
- In the Export – PDF window, decide whether to Save export steps or not. Click Close.
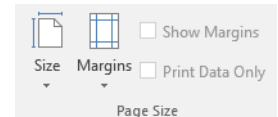
6.2 Printing

6.2.1 Change table, form, query output, report orientation: portrait, landscape.
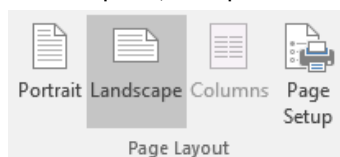
- Open the table, form, query output or report.
- On the File tab, click Print.

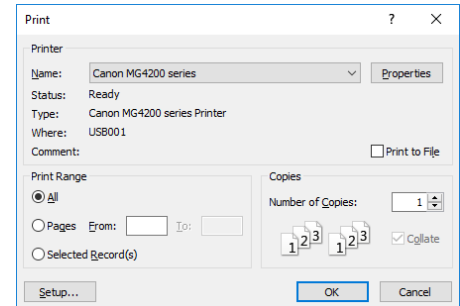- Click Print Preview.
- On the Print Preview tab, in the Page Layout group, click the Portrait or Landscape buttons.

6.2.1 Change paper size.

- On the File tab, click Print.
- Click Print Preview.
- On the Print Preview tab, in the Page Size group, click the Size button.
- Click the size required.

6.2.2 Print a page.

- On the File tab, click Print.
- Click Print.
- Click OK.

6.2.2 Print selected record(s).
- Select the records to print.
- On the File tab, click Print.
- Click Print.
- Check the Selected Record(s) checkbox.
- Click OK.

6.2.2 Print a complete table.
- On the File tab, click Print.
- Click Print.
- Ensure the All check box is checked.
- Click OK.

6.2.3 Print all records, specific page(s) using form layout.
- On the File tab, click Print.
- Click Print.
- To print all records, ensure the All checkbox is checked.
- To print specific pages, check the Pages checkbox and enter the required number references in the From: and To: boxes.
- Click OK.

6.2.4 Print the result of a query.
- On the File tab, click Print.
- Click Print.
- Click OK.

6.2.5 Print specific page(s) in a report, print complete report.
- On the File tab, click Print.
- Click Print.
- To print all pages, ensure the All check box is checked.
- To print specific pages, check the Pages check box and enter the required number references in the From: and To: boxes.
- Click OK.

For more information,
visit: **www.ICDL.org**