List some key words related to your research:

(See the key word search form)

Sources to look at (use your keywords to search for articles):

- Search engines (formal materials): scholar.google, PubMed, Scopus
- Forums (informal materials): quora, research gate, academia.edu

Must read at least 2 papers a day. Read as much as you can. Reading is the only way you will achieve desired knowledge. Learn to read faster (you will achieve this by regular reading).

Reading a Research Paper

First Step: Read the title carefully. Try to guess the content from the title.

Second Step: Read the abstract. Read twice. Mark down the followings:

- What is the main area (or problem focused) in the article?
- Main contributions claimed by the authors i.e., they developed a new method, or they increased the performance of an existing method, or they removed some drawbacks of an existing system etc.
- What results did they achieve?

Third Step: Read the introduction and conclusion. Read the section and sub-section headings, but ignore everything else. Glance over the references to check if you have read any of them or not.

Try to understand:

- What is the problem addressed in the paper?
- What techniques do the authors follow?
- What do they achieve?
- Is there any future research direction?

After this step you will decide whether you need to read the details or not. At this stage you should be able to answer the five Cs:

1. *Category*: What type of paper is this? A measurement paper? An analysis of an existing system? A description of a research prototype?
2. *Context*: Which other papers is it related to? Which theoretical bases were used to analyse the problem?
3. *Correctness*: Do the assumptions appear to be valid?
4. *Contributions*: What are the paper's main contributions?
5. *Clarity*: Is the paper well written?

Using this information, you may choose not to read further. This could be because the paper doesn't interest you, or you don't know enough about the area to understand the paper, or that the authors make invalid assumptions. The first pass is adequate for papers that aren't in your research area, but may someday prove relevant.

Fourth Step: Read the paper with greater care, but ignore details such as proofs. It helps to jot down the key points, or to make comments in the margins, as you read.

1. Examine the figures, diagrams, equations and other illustrations in the paper. Pay special attention to graphs. Are the axes properly labelled? Are results shown with error bars, so that conclusions are statistically significant? Common mistakes like these will separate rushed, shoddy work from the truly excellent.
2. Mark unread references you think you should read to gain background knowledge.

After this pass, you should be able to grasp the content of the paper. You should be able to summarize the main focus of the paper, with supporting evidence, to someone else (note it down).

Sometimes you won't understand a paper even at the end. This may be because the subject matter is new to you, with unfamiliar terminology and acronyms. Or the authors may use a proof or experimental technique that you don't understand, so that the bulk of the paper is incomprehensible. The paper may be poorly written with unsubstantiated assertions and numerous forward references. Or it could just be that it's late at night and you're tired. You can now choose to:

1. set the paper aside, hoping you don't need to understand the material to be successful in your career,
2. return to the paper later, perhaps after reading background material or
3. stick to it and go on to the next step.

Fifth Step: In this step you should read inside the paper thoroughly. Start with background, go to related work (some authors put this section just before conclusion), then read proposed model or system. Now take some time to look at your notes (taken from the above steps) to cross check with claims and methods etc. When you get the idea now judge their experimental setup and results carefully. Some articles use experiments, some use mathematical proofs, or simulation, in any case you should be sceptical. Everything in black and white is not always true!!!

The key to this step is to attempt to virtually re-implement the paper: that is, making the same assumptions as the authors, re-create the work. By comparing this re-creation with the actual paper, you can easily identify not only a paper's innovations, but also its hidden failings and assumptions. You should be able to reconstruct the entire structure of the paper from memory, as well as be able to identify its strong and weak points. In particular, you should be able to pinpoint implicit assumptions, missing citations to relevant work, and potential issues with experimental or analytical techniques.

After reading a paper write a review of what you have read. In the following format:

Title of the article: _____

List of Authors: _____

Publication Source: _____

Key: _____   Year: _____   Citations: _____

Answer the five Cs:
Category:
Context:

Correctness:

Contributions:

Clarity:

Summary:

3 or more strong sides of the paper:

3 or more weak sides of the paper:

Your Comments:

Writing a Literature Survey

After reading at least 50 papers according to the above guideline, you should have 50 summaries. They can make a nice survey in your field. Now, categorize the summaries i.e., which methods are similar, or those following the same approach. You must discuss merits and demerits of each article in the same group and the way different groups differ.

First, use an academic search engine and some well-chosen keywords (listed at the beginning) to find three to five recent papers in the area. Go up to step 3 up on each paper to get a sense of the work, then read their related work sections. You will find a thumbnail summary of the recent work, and perhaps, if you are lucky, a pointer to a recent survey paper. If you can find such a survey, read the survey.

Find shared citations and repeated author names in the bibliography of all the papers. These are the key papers and researchers in that area. Download the key papers and set them aside. Then go to the websites of the key researchers and see where they've published recently. That will help you identify the top conferences in that field because the best researchers usually publish in the top conferences.

Go to the website for these top conferences and look through their recent proceedings. A quick scan will usually identify recent high-quality related work. These papers, along with the ones you set aside earlier, constitute the first version of your survey. Go up to step 04 through these papers. If they all cite a key paper that you did not find earlier, obtain and read it, iterating as necessary.

Knowledge Acquisition Form

Topic: _____

What I Know	
What I Want to Know	
What I Learned	
Sources	

Research Guidelines

Topic: _____

Keywords: _____

Questions I want answered:

Q1	
Q2	
Q3	
Q4	
Q5	

Questions *x*:
Notes on Question *x*
Sources

Key Word Search Form

My Research Question is: _____

The key words which could lead me to good information might be:

Brainstorm A List of Key Words

Select the Best Key Words from Your Brainstorm List	
Key Word	**Explanation of why this might be a good key word**