The present work entitled “Study of transition metal complexes of some new ortho hydroxy-chalcone derivatives ” is divided into five chapters.

Chapter-I:
Introduction
In this chapter a general survey of literature of importance of 2'- hydroxychalcone and their metal complexes has been discussed briefly. Further the complexes of 2'-hydroxychalcones have been discussed.

Chapter-II:
This chapter is divided into three sections.
Section-I: Synthesis of New α β-unsaturated Carbonyl Compounds (Chalcones)

In the present work α, β-unsaturated carbonyl compounds were synthesized by employing Claisen-Schmidt condensation method.

A mixture of substituted acetophenones and 5-bromothiophene-2-carbaldehyde / 2,5-dimethoxybenzaldehyde were condensed in alkaline medium (NaOH) by using Ethanol as a solvent.

The structures of the products were confirmed by the IR, ¹H NMR and Mass spectroscopic data.

Scheme 1:
Section-II: This section is subdivided into two subsections.

Section-A: Synthesis of N-Hydro-2-Pyrazolines

Substituted Chalcones were treated with hydrazine hydrate (99%) in methanol for 5 hours to afforded corresponding products.

The structures of the products were established on the basis of 1R, 1H NMR, and Mass spectroscopic data.

Scheme 2:

![Scheme 2 Image]

R₁ = I, Cl   R₂ = H   R₃ = I, Cl, CH₃

Section-B: Synthesis of N-Acetyl-2-Pyrazolines

Here we report substituted Chalcones were treated with hydrazine hydrate (99%) in acetic acid solvent for 5 hours to formed acer-pyrazolines.

The structures of the compounds were elucidated on the basis of their spectroscopic data.

Scheme 3:
Section-III: Synthesis of Metal Complexes

In this chapter synthesis of aimed transition metal complexes using 2'-hydroxychalcones such as la, lb, lc, ld, le and lf and transition metal salts, complexes of Cu (II), Ni (II), Co (II), Fe (II), and Zn (II) are discussed.

Chapter-III:
Experimental Techniques

In this chapter the experimental details of measurement of solution conductivity, magnetic susceptibility; electronic spectra, IR, ESR, XRD and TGA, DTA are discussed.

Chapter-IV:
Results and Discussion

This chapter deals with experimental results of conductivity, magnetic susceptibility, electronic spectra of Cu (II), Ni (II), Co (II), Fe (II) and Zn (II)complexes of 2'-hydroxychalcones are given. Further IR spectra of ligands and their metal complexes are taken and represented. ESR spectra of some Cu (II) complexes are taken. Similarly XRD and TGA of some metal complexes are taken and represented on the basis of results obtained.

Hence the structures of the complexes are confirmed.

Chapter-V:
Antimicrobial Activity of Newly Synthesized Compounds

All the newly Synthesized Compounds like Chalcones, N-Hydro-2-pyrazolines, N-Acetyl-2-Pyrazolines and metal complexes were evaluated for their antimicrobial activity against different bacteria and fungi. All synthesized compounds showed moderate to good activity.