Plane to synthesized different types of Chalcone derivative are as follow:

- (E)-N-(4-(3-cinnamoylphenoxy)phenyl)-2-methyl-5-nitrobenzenesulfonamide.
- 2-methyl-5-nitro-N-(4-(3-(6-phenyl-2-thioxo-1,2,5,6-tetrahydropyrimidin-4-yl)phenoxy)phenyl)benzenesulfonamide.
- 2-methyl-5-nitro-N-(4-(2-phenyl-2,3-dihydrobenzo[b][1,4]thiazepin-4-yl)phenyl)benzenesulfonamide.
- 2-methyl-5-nitro-N-(4-(3-substituted-4,5-dihydroisoxazol-3-yl)phenoxy)phenyl)benzenesulfonamide.
- 2-methyl-5-nitro-N-(4-(3-((3-phenylquinoxalin-2-yl)methyl)phenoxy)phenyl)benzenesulfonamide.
- 2-methyl-5-nitro-N-(4-(3-(2-oxo-6-phenyl-1,2,5,6-tetrahydropyrimidin-4-yl)phenoxy)phenyl)benzenesulfonamide.
- N-(4-(3-(1-(2,4-dinitrophenyl)-5-phenyl-4,5-dihydro-1H-pyrazol-3-yl)phenoxy)phenyl)-2-methyl-5- nitrobenzenesulfonamide.
- 2-methyl-5-nitro-N-(4-(3-(5-phenyl-4,5-dihydro-1H-pyrazol-3-yl)phenoxy)phenyl)benzenesulfonamide.
**ALDEHYDES USED FOR CHALCONE DERIVATIVES**: 

- Benzaldehyde 
- 4-anisaldehyde 
- 2-anisaldehyde 
- Salicyaldehyde 
- 2-chlorobenzaldehyde 
- 4-chlorobenzaldehyde 
- 2-nitrobenzaldehyde 
- 3-bromobenzaldehyde 
- 3,4-dimethoxybenzaldehyde 
- 3,4,5-trimethoxybenzaldehyde 

1. **Work plane and Methodology**

**Research Methodology:**

a. **Materials:**

**Preparation of N-(4-(4-acetylphenoxy)phenyl)-2-methyl -5-nitrobenzenesulfonamide**

In a round bottom flask, 1-(4-(4-aminophenoxy)phenyl)ethanone was dissolved in pyridine and 4-nitrotoluene-2-sulfonyl chloride was added to it with constant stirring maintaining the temperature below 25°C. After the completion of the addition the mixture was refluxed for 2 hours, and then it was cooled and poured into crushed ice. Solid was separated by filtration and crystalline from ethanol.
b. **Synthetic approach:**

**General Route of Synthesis of Chalcone derivatives:**
Consider R as different aldehydes.

(a) Preparation of 2-methyl-5-nitro-N-(4-(3-(6-phenyl-2-thioxo-1,2,5,6-tetrahydropyrimidin-4-yl)phenoxy)phenyl)benzenesulfonamide.

A mixture of (E)-N-(4-(3-cinnamoylphenoxy)phenyl)-2-methyl-5-nitrobenzenesulfonamide and thiourea in ethanol and con.HCl was refluxed for 12 hours. The reaction mixture was then filtered while hot, allowed to cool and neutralized with NaOH. The resulting solid was washed several times with water, dried and crystallised from ethanol.

(b) N-(4-(3-(2-(4-methoxyphenyl)-2,3-dihydrobenzo[b][1,4]thiazepin-4-yl)phenoxy)phenyl)-2-methyl-5-nitrobenzenesulfonamide

A mixture of (E)-N-(4-(3-(3-(4-methoxyphenyl)acryloyl)phenoxy)phenyl)-2-methyl-5-nitrobenzenesulfonamide and 2-aminobenzenethiol in anhydrous methanol and glacial acetic
acid was refluxed on water-bath at 60-70 for 2 hours. The reaction mixture was then filtered while hot, allow to cool and neutralized with NaOH. The resulting solid was washed several times with water, dried and crystallized from ethanol.

**Preparation of 2-methyl-5-nitro-N-(4-(3-(5-phenyl-4,5-dihydroisoxazol-3-yl)phenoxy)phenyl) Benzenesulfonamide.**

A mixture of (E)-N-(4-(3-cinnamoylphenoxy)phenyl)-2-methyl-5-nitrobenzenesulfonamide and hydroxylamine hydrochloride in ethanol and potassium hydrochloride was refluxed on water-bath at 60-70°C for 2 hours. The reaction mixture was then filtered while hot, allow to cool. The resulting solid was crystallized from ethanol.

**2. Characterization:**

**Melting points:**

All melting points were determined in open capillaries in a liquid paraffin bath and are uncorrected. The IR spectra were recorded with KBr pellets on Perkin - Elmer - 783 spectrophotometer and 1H NMR spectra were recorded on a Varian Geminy 200 MHz spectrophotometer with CDCl3 / DMSO-d6 as a solvent using tetramethylsilane (T.M.S.) as an internal standard; the chemical shift values are in d ppm. The purity of the compounds was checked by thin layer chromatography (T.L.C.) on silica gel coated glass plates. The elemental analysis (i.e. C, H and N analysis) has been done on Carlo - Erba - 1108 analyzer and the values are within the permissible limits (i.e. + 0.5) of their calculated values.

**Antimicrobial activity:**

Antimicrobial activity of newly synthesised compounds was studied against gram-positive bacteria *Staphylococcus aureus* and gram-negative bacteria *Escherichia coli* (for antibacterial activity) and against the culture “Candela albicans” (for antifungal activity). The antimicrobial screening was carried out by cup - plate method at a concentration of 50 mg.mL⁻¹ in solvent
D.M.F. The zone of inhibition was measured in mm. The antimicrobial activity of the synthesised compounds was compared with standard drugs Ampicillin, Penicillin and Tetracycline at the same concentration.

**Toxicity Screening**

The objective of this study was to evaluate the toxicity effects of the synthesized compounds on brine shrimp or *Artemia salina*. The assay proven to be a convenient system for monitoring biological activity since it is inexpensive, rapid, reproducible, statistically valid and require very little of the test substance (29 - 34). The brine shrimp eggs were hatched in an artificial sea water. Compounds were tested at concentrations of 10, 100 and 1000 ppm after being placed in vials containing 5 mL of brine and ten larvae in each of three replicates. Survivors were counted after 24 hours. The data were analyzed by a Finney Probit analysis program. LD50 indicates the median lethal dose required to kill or weaken 50% of the organisms. Values below 100 ppm were considered as toxic level for tested pure compounds.

**Instrumentations**

Several instruments were used to characterize all the compounds obtained in the experiments. Infrared (IR) spectra were recorded on a Shimadzu 8000 as thin film (NaCl windows) for liquid and nujol mull and KBr pellet for solid samples. 1H and 13C NMR (spectra) were recorded by using Bruker Avance spectrometer (400 and 100 MHz) with CDCl3 as the solvent. Hewlett Packard Model 6890 series II A gas chromatography was used in this study. The capillary column of Ultra (fused silica column) which composed 100% dimethylpolycyclohexane was used. The capillary column has an inner diameter of 0.32 mm, 25 m in length and 0.17 μm in thickness. The operational conditions for GC conducted with Ultra 1 were as follows:

Operational temperature : 50-310\(^{0}\) c
Syringe temperature : 300\(^{0}\) c
Detector: \(300^\circ\)C
Detector temperature: Flame ionization detector (FID)
Carrier gas: Helium (flow rate 1.82 mL/min)

The spectra of gas chromatography-mass spectrometry (GC-MS) were recorded using a Hewlett Packard Model 5980 A gas chromatography and a Hewlett Packard Model 5989 A mass spectrometer.

**Work Plane:**

- In first six month Planning for literature survey.
- In other month understanding the raw materials and methods of synthesis.
- Synthesis of Chalcone Derivatives by different aldehydes.
- Study the results and do preparation of Thesis work.